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EDITORIAL.

THE NEW NATIONAL HEALTH BILL.

The measure for a National Department of Health is thus far neither lost nor won. The failure of the bill to make its passage through the last Congress is an undoubted advantage to everybody concerned, for the new bill introduced by Senator Owen into the present Congress shows the profitable fruits resulting from the free discussions and equally frank criticisms of the former measure, both inside and outside the profession; and the outcome is a far more practicable and statesmanlike document, since the interests of all the pros and cons are well conserved.

As regards the motives which actuated the original bill, and the genuineness of its aims, no question need be raised, at least among medical men. Whatever shortcomings it may have exhibited were faults of judgment, not of intent. Like almost every newly-embodied reform, it was radical in its spirit, and vague in its letter. The present bill, matured by criticism and reflection, is more conservative in its scope, and its logical construction and practicality are factors which should not go unheeded.

The honest and disinterested objectors to the measure, fall readily into three classes. (The dishonest and interested objectors need not be reckoned with.) (1) Those who regard it as unnecessary, and who may be called reactionaries. (2) Those who view it with alarm as subversive of state rights and individual liberty, and who may be termed radicals. (3) Those who, while admitting the advantages and the legitimacy of the measure, nevertheless fear that its administration will give rise to abuses which will more than offset its benefits.

To the first of these classes, of course, no new legislation that may show the inherent weakness and worthlessness of an old system is justifiable. One cannot argue with a reactionary, albeit, as will appear, the present

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bill has in it an element of rejoinder even to these nugatory objections.

To the second class of objectors the construction and language of the revised bill ought to furnish ample evidence of the good faith of its proponents and security of the rights guaranteed under the Constitution. The most rabid stickler for personal liberty can find nothing in this measure which, by the furthest stretch of imagination, could be suspected of conflicting will the bill of rights. It ought, indeed, to be broadly apparent that no such subversive powers could, in the nature of things, be conferred by such a statute, since all such usurpations are exercises of police power, and Congress has no police function either to exercise or to delegate. And it should be equally apparent that in whatsoever the statute creating the Department might transcend the provisions of the Constitution, it would be to that extent untenable, and a remedy is readily at hand. But the fact is that neither of these broad elements of assurance needs to be invoked, since the specific stipulations of the province and duty of the proposed Department carefully draw the prohibitive circle around these touchy points, and expressly exclude the recognition by the Department of any school or system of medicine. Not only do its province and duties include nothing of a mandatory or prohibitive nature, being limited to the "fostering and promotion of the public health, and to the collection and dissemination of information relating thereto," (and the detailed specification of Bureaus in Section 5 dispels any lurking suspicion of dangerous indefiniteness about these definitions), but the concern of the Department is altogether with matters in which no shade of opinion or personal belief is involved, and in which, therefore, no question of individual liberty is at stake—matters of fact and observation in which all are equally represented.

The third conservative class of objectors is perhaps the most plausible in its attitude, and under the original form of the bill—radical in its departures and loose in its specifications—might have had a good show of reason for its opposition. But the conservative censorship displayed in the construction of the present bill would seem completely to disarm this kind of objection. The fact is—and here is to be found the rejoinder to the reactionary objectors—the bill now before the Senate is, in effect, little more than a sensible centralization and orientation of the health functions of the Federal Government which already exist in scattered and disjointed, and hence in proportionately ineffective, form. To organize and dovetail them will not only vastly increase their efficiency, but by just so much will lessen their opportunity for leaks and graft and other sorts of abuse; and if abuses do occur, it will be a much simpler matter to place responsibility and apply a corrective.

In short, a careful and intelligent scrutiny of the new bill shows it in the light of a conservative and statesmanlike step in the right direction, and drawn up with the view of effecting a legislative advance with the least possible disturbance of existing conditions. The criterion of good and wise legislation is caution which has been so well-weighed that snares and pitfalls may be avoided, yet broad and potential enough to afford ample range for judicial expansion and development as time and experience may suggest. Whatever may have been true of the former bill, the present one is worthy the intelligent, active support of the entire profession. No man need be ashamed to sponsor it, or afraid to defend it against all antagonists.

THE BOY SCOUTS.

No subject in medicine in recent years has received closer attention, on the part of thinking medical men, than that of athleticism. Just what this rather awkward word means, no one has yet decided; for if we are to believe the opponents of the education of the body, it is a Juggernaut that mows down all our vital forces, though the development of the muscle may deceive us for a time; and, if we rally with the enthusiasts, a diametrically opposite view is taken that is turgid with promises of a bodily health that must be an ungracious host to the many diseases which are continually battling for entrance into our organism. The philosopher, whose mood is gentle and whose voice has not the resounding qualities of a protagonist, must needs view the situation with a considerable degree of humor,—that is if his readings have been among the various medical journals which publish articles on athleticism with rare indiscrimination,—for directly one or another physician sees a "case," be it that of an adolescent, whose judgment has been askew, or a corpulent subject who, at the age of fifty, is desirous of developing his muscles at the expense of his overweight, the disastrous results are chronicled in the medical press, and another "case" is on record to swell the statistics showing the untoward consequences from subjecting the body to violent exercise. The articles in question are not as worthless as they would seem at first sight, but where their error lies is in this, that the foolhardiness, on the part of the embryo athletes, is completely overlooked and the inroads on their health greatly exaggerated. But if the real cause of ill-health in after-years is not made as attributable to lack of common sense as it should be in these articles, we should not wax indignant, for the rank and file of our medical writers—and for that matter even some of the elect—are rarely philosophers: as may be wit-

nessed upon reading the multifarious articles on ventilation and draughts, or the recent utterance of Sir Almroth Wright before the National Health Society of London, as to the devilish inherent qualities of soap and water!

What ought to interest medical men in the matter of athletics—and now we are not disparaging any one article that may open our eyes to its abuses—is the subject of physical training and boyhood. By the advocacy of what should constitute the physical life of the growing youth, ideas are instilled which must bear fruit; for a sanity might be learned in connection with athletics that will remain with the subject even during those troublous years, when his girth proclaims that the laxity he has been indulging in must cease. To harden the muscles in youth cannot be aught but an excellent foundation for the superstructure which the coming years erect: the superstructure that is necessarily continually at war with the exigencies of our superior civilization.

To combat the physical detriments which accompany the mature days of a normal man's life, a movement has been started in this country that should have the full support of all medical men. We are now referring to the Boy Scouts, an organization that is the counterpart of a similiar organization in England, the incentive for which sprang from the fertile brain of Sir General Robert Baden-Powell, the defender of Mafeking. And if one tears oneself away from all ideas of militarism—the movement, though started by a military man, has none of those objectionable features which at once convert our anti-militarists into bulls in china shops—one can see that here we have what is about the sanest chapter in the stupendous and wellnigh unintelligble series of books on the physical training of the young. For, be it said at once, those exact and precise Teutonic ideas, which have obsessed us for years in the matter of gymnastic performances, have been abolished, and in their stead a number of physical exercises of the mildest sort have been introduced. What these are can be well summed up by the statement that they are all practised out-of-doors, and have the great advantage of being superior to the turning-pole and dumb-bells in so far as stuffy rooms are no longer a necessary concomitant. Cross-country walks, target practice, musketry drills, the deep inspiration of fresh air, the free play of the muscles, the mental equipoise which only contact with Nature can teach, are surely assets in this new physical training that should give us pause. The very simplicity of all the ideas, which the English organizer formulated, and which Mr. Ernest Thompson Seton is advocating so successfully in this country, is illustrative of the fact that in simplicity lies the hope of a betterment of our physical structures, and that the sooner we restore

Nature to her former position of unrivalled instructress, just so soon will our manhood be a text for stirring sermons. So, perhaps after all, Rousseau was right.

A "FREUDIAN" NOVEL.

A student of modern medicine, who is interested in the interplay of medical theories and the trend of literature, cannot but be struck with the truism that certain forms of literature—plays and novels, especially—derive their inspirations and impulses, in quite a goodly number of cases, from the theories which are uppermost in the medical mind. The literary brain, it would seem, ever on the look-out for new ideas, takes kindly to the appropriation of current medical thought, and while in some instances the appropriation is attended by a sensationalism that spells distortion of the real facts, in others the resultant performance is far from being mean. Illustrations of this assertion are to be found in Zola's "L'Assommoir" and Ibsen's "Ghosts," to cite two works of unusual merit, though these by no means exhaust the list of the literary photographs which contain, in a striking manner, medical verisimilitudes that might with profit engage the earnest thought even of the closest students of medical textbooks. We say "with profit," for can it be asserted, with any show of reason, that when the picture is limned by a master there are no advantages in a presentation that is no longer the dry-as-dust syndrome, unassociated with temperament, idiosyncrasies, and environment?

If, therefore, it is right and proper, from our point of view, to transfer medical facts to plays and novels, provided the crucible through which such facts pass is a dependable instrument, our attitude is nevertheless stubbornly non-acceptant, if the unproved theories of a medical author are set forth in such manner that the art of the novelist glozes over their inherent weaknesses so that the uniniated are led to believe the principal character depicted one of a type. A case in point is the novel "Das Gefærliche Alter" (The Dangerous Age), as it is called in German, by the Danish writer, Madame Karin Michaëlis, and which, on account the Freudian sexual theory of hysteria that it embodies in its heroine, Elsie Lindtner, and a number of her intimate friends, has been seized upon by the critics and thousands of readers in Germany as a type of womanhood that is prevalent enough to arrest attention.

We would not pause over this literary expression, for any length of time, were it not that here is no tried medical fact brought to light in

fiction, but a theory that has been disputed by such men as Alt, Aschaffenburg, Foerster, Moll, Friedlaender, Kraepelin, Heilbronner and others. As a theory it might stand for much in medical literature, but outside its appointed province, especially when it is garnished with considerable literary grace, it can be productive of nothing else but great harm; a statement which is not an exaggeration, since already the majority of the recognized critics in Germany are loud in their praise of a writer who has the courage to tell the truth about women. And here is would be well to draw the attention of the reader to the vast difference between medical facts and theories, when these are exploited in the literature of the day. A fact is applicable only to a limited number of persons, no matter how desirous the critic or intelligent reader may be to make its applicability universal; whereas a theory, on account of its elasticity, is so adaptable to all, that at once it is made to fit every case that shows the slightest deviation from what the superficiality and narrowmindedness of both critic and reader considers normal. This was well shown when Lombroso gave his ideas on degeneration to the world, and if we mistake not the same farce is about to be repeated in connection with the Freudian sexual theory of hysteria.

OPINION AND CRITICISM.

BACTERIOLOGY IN 1720.

Those of us, who are inclined to think that systematic bacteriology began in the latter part of the nineteenth century, would be surprised to know that among the earlier and sometimes vague gropings for the truth of the early eighteenth century, there resulted at least one book with a clear and definite purpose. According to a recent number of the Lancet, the year 1720 produced a book by Benjamin Martin, entitled "A New Theory of Consumptions, more especially of a Phthisis, or consumption of the lungs wherein enquiry is made concerning the prime essential and hitherto accounted inexplicable cause of that disease so very endemic to this nation." The abstracts of this book as given in the *Lancet* are really remarkably clear, and leave no doubt that the author considered tuberculosis, and other infectious diseases like leprosy and syphilis to be due to specific micro-organisms whose character must vary with the disease. Furthermore, definite ideas are expressed regarding the mode of infection, of secondary infections, and of the metastatic processes seen in some infectious diseases. It is especially interesting to notice that Martin explains in the same way as is explained to-day, why not all people who are associated with tuberculosis become infected, by his suggestion that possibly the number of *animalcula* is not sufficient to produce trouble, or that the patient in whom they lodge does not furnish good soil for their growth. This is not much further than we have got in the study of infectious diseases to-day.

It would, indeed, be unusually interesting and instructive to make a comparison between the original book of Martin and Pasteur's work, or the latest textbooks on bacteriology and infections. The pendulum of medical thought, constantly swinging from one point to another, almost invariably hits a point which has been previously reached; consequently discoveries of old facts are much commoner than the finding of something perfectly new. Possibly this explains to a certain extent the tendency of many continental writers to re-discover anything in scientific medicine that has been previously discovered and discussed by an American writer.

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This brings up forcibly the state of affairs in the medical literature of to-day and the inconveniences to a reader bent on acquiring further knowedge in his specialty. Anyone doing scientific medicine either in the laboratory or in practice is confronted with a problem of grave

import—how to do his reading. He must read to keep up with the times, and yet the material he needs is often so scattered as to make it impossible for him to gather it together. No matter how ambitious or how zealous a man may be, no matter if he has learned "How to Live on 24 Hours a Day," he must neglect something. How to give the reader the best opportunity to do his reading is not an easy problem to solve. To-day the profession must carry the burden of new and revised editions, of systems in duplicate, of several books filling the same purpose, and, in general, of an over-abundant production of medical literature. Many so-called revised editions—new editions—are simply financial enterprises in which an addition of a few plates, or revision of one chapter makes an excuse for publication.

Should there not be a national or international clearing house of medical literature? Ought not a man who is interested, for instance, in the study of diabetes, be able to find grouped together, practically in one binding, all the work on diabetes? It surely would be better, not only for the convenience of the reader, but for the historical recording of medicine, if some such scheme were practical. A worker in one subject would be enabled very easily to find out exactly what has been done in that subject, and a repetition of work already done would be prevented to a great extent. The economy to all concerned is too manifest to be further emphasized.

Perhaps the monographs, or the collection of articles by specialists on one subject, will offer at least a partial solution to this question. The standard textbooks, or one good system as a working basis, in addition to these monographs, would give a specialist practically all he needs, and would offer a constant supply of literature on the latest phases of the subject in which he is interested.

ANOTHER MOVE IN MEDICAL EDUCATION.

If the announcement regarding the changes in the staff of the Johns Hopkins Hospital, requiring all members to give up private practice and devote their time completely to hospital and teaching work will stand, certainly a new era is in store for American medicine. Just as Johns Hopkins was the first institution in this country to demand a high standard of preliminary medical education in students, so it seems it would be the first to demand corresponding qualifications in its professors in the clinical branches.

The idea that medicine, surgery, gynecology and obstetrics should be as much a part of a university curriculum as are the so-called premedical sciences, has been gaining ground very rapidly in this country, and has already taken firm root abroad. In these columns we have often referred to the necessity of basing the practice of medicine on scientific grounds,

and we have often urged that one solution was the inauguration into the professorships of the clinical branches, of men highly trained for that position, who shall devote certainly the major part of their time to teaching, and to carrying on that amount of investigation which the progress of to-day demands. Such positions cannot be filled by the men who devote an occasional part of their time to teaching. Whether at the present day, it is wise to require a complete requirement from private work, we think might be questioned. From the standpoint of the public, it might be said that the best men should be at their call; but this can be answered logically by permitting the "leader" to do private work in the hospital only. It should also be urged that in an idealized university course the position of head of the department must be supported by numerous men of a more purely clinical type; men who are as necessary for the successful performance of the duties of such department as is the head. These men, of course, need not give up their entire time to teaching, or hospital work, and they can well attend in just as good a manner to the demands of the public for consultation of the first order.

LITERARY NOTE.

Dr. Limon, according to the *Revue médicale de la Franche-Comté* for January, has recently discovered, in the library of his native town, Besançon, an interesting manuscript by a Milanese physician of the fifteenth century, one Guy Paré. The title of this valuable manuscript is "The Regimen of Health," and it shows most indubitably that the physicians of those far-away times understood the importance of hygiene even better than medicine, which we must admit was not quite the science it is to-day. The special branch of hygiene that should interest us in this manuscript pertains to the mouth, and considering the paucity of articles on this important subject in the medical journals, a reproduction of the author's wise instructions cannot be without point. Paré writes: "To maintain the mouth in a state of health, it is advisable to wash it with warm water before and after eating, because this cleanses the mouth and removes the humors from the gums. These humors arise from the food taken, and when not removed are conducive to a bad breath. It is necessary to clean the teeth daily by rubbing them each morning before breakfast with a powder prepared from cloves, nutmeg and a spice called spikenard, which is an ingredient of hippocras. The following will render the breath pure and sweet: lemon, galangal, aloes, a spice called 'mastic cinnamon myrabolan,' preserved Tribuli, and nutmeg. Item, the electuary made of quince; the electuary made of cloves; the electuary made of musk. The following render the mouth foul and from this one should guard oneself: Quicksilver corrupts the mouth and the saliva. Item,

the particles of food which remain between the teeth after eating, even when only milk is taken, and which decompose slowly, befoul the breath. Item, the mouth should be carefully washed and the gums rubbed with a powdered bark or peel that is bitter and styptic. Also a layer of this should be placed on the tongue. One should be careful about biting into things that are hard, lest the teeth break off, or eating dates, honey, and other sticky sweets. Vomiting should be stopped as soon as possible, since the teeth are affected in this way. Item, one should abstain from eating cold food because cold is harmful to the teeth. The following are also bad for the teeth: milk, pomegranate, leek and radishes. Lemon peel and sage leaves should be rubbed on the teeth. Also this powder: one drachm of hartshorn, one drachm of the seeds of a tree called thamaris, one drachm of a root called cyperi, one drachm of roses, one drachm of a spice called spica, and one-fourth of a drachm of rock salt. These ingredients should be well mixed and then passed through cloth. Before using this powder the teeth should be washed and all remains of food, that might be clinging to the gums, removed. Item, those princes and grand seigneurs, who wish to be careful as to the cleanliness of their teeth, should use a powder made of pearls and sugar. This is highly beneficial, but very expensive."

The advice given by this fifteenth-century physician might be studied to-day with profit, for it contains that insistence on mouth cleanliness which our advanced civilization is just beginning to consider as of moment. The preparations which were used may meet with criticism, especially the powder composed of pearls and sugar, but this is of minor importance compared with the knowledge, which was Paré's, in regard to what really constitutes prophylaxis in the matter of mouth hygiene.

ORIGINAL ARTICLES.

THE TREATMENT OF CLUB-FOOT IN INFANCY.

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That club-foot is practically curable, both as to form and function, in nearly all cases during infancy, and that, too, by relatively simple measures, has been sufficiently demonstrated. Yet that this happy result is by no means the rule and that, even when attained, the required treatment is often unduly prolonged or severe is well known. Moreover, despite the proven efficacy of proper treatment, it is unfortunately not uncommon to see cases that have been allowed to drag on into late childhood with deformity still uncorrected or those in which the use of inefficient apparatus has been persisted in until irremedial atrophy has taken place.

It may, therefore, not be out of place to again review the advantages of the treatment of club-foot during infancy and to discuss the principles and methods involved; the former especially, since some writers of excellent experience have lately advocated the delay of active treatment until the walking period has begun.

Advantages of Treatment in Earliest Childhood.—The advantages of beginning treatment at the earliest possible moment would seem sufficiently obvious. (1) Correction is facilitated in the first months of life by the cartilaginous nature of the bones and the more delicate condition of the soft parts; at birth deformity may often be readily corrected or even over-corrected. (2) The rapid increase in size during the early months of life is thus made to act as an aid in correction rather than allowed to favor adaptation to the deformed position. During the first three months the increase in size of the average child is about equal to that of the succeeding nine months, while the increase of the first year compared to that of the second is in the proportion of 16 to 5. (3) The earlier the foot is maintained in the over-corrected position the greater the chances of the bones acquiring their proper shape and so the more liklihood of securing perfect function.

The objections raised to treatment during the first months are chiefly the following: (a) The possibility of injuring the delicate tissues of the

foot or of impairing the general health of the young baby. Against this may be urged that the measures used may, and should, be adapted to the age and the condition of the infant, it being possible to gradually correct deformity without the use of measures which will irritate the normal infant. (b) The small size of the foot, and so the difficulty of keeping plaster-of-Paris and other dressings in place. This may be overcome early in treatment by the use of simple splints, maintained in position by adhesive plaster, or in some cases by the use of adhesive strapping alone. After a sufficient degree of correction has been secured to permit of the foot being placed in dorsal flexion, this difficulty is not so great; moreover, by carrying the plaster-of-Paris cast up over the flexed knee slipping is rendered less likely. (c) The fact that partial relapse may occur after walking has been begun, necessitating a second period of treatment or a second operative manipulation. It will hardly be claimed that relapse will be of frequent occurrence under careful treatment or, where it is allowed to occur, that it will be complete in more than occasional instances. The successful cases are far too numerous and the advantages of early treatment too great for one to be deterred by the disappointment of an occasional relapse. (d) That walking is necessary for a cure. It must be granted that a cure cannot rightly be claimed until the use of the foot in walking has demonstrated its normal condition. Yet while admitting this and also fully recognizing the value of walking in reshaping the bones of patients after the first year, I do not regard it as a necessity in cases in which treatment is begun soon after birth; and not only this but it even seems to me that *the fact that the little patient cannot walk has a distinct advantage in that it permits of the maintenance of a degree of over-correction which would be impossible for the walking child.*

Working Analysis of the Deformity.—In a discussion limited to the treatment of congenital talipes equinovarus the more minute pathology may properly be disregarded and attention directed only to the various factors which influence treatment. The two chief elements, the equinus (deformity of plantar flexion) and the varus (deformity of adduction and inversion), are present in such varying degrees that cases differ markedly and it is only by a proper estimation of the various factors present in the individual case that a good result can be easily and quickly secured. In attempting a working analysis of the deformity, these factors may be conveniently divided into three groups:—

I. Deformity in the foot.
   1. Inward bending of the foot upon itself in the horizontal plane, —adduction.
   2. Downward bending of the foot upon itself in the vertical plane, —cavus.
   3. Inward bending of the foot upon itself in the sagittal plane, —inversion.

II. Deformity in the relation of the foot to the leg.
4. Extension (plantar flexion) of the foot upon the leg,—equinus.
5. Inward rotation of the foot upon the leg.
III. Deformity in the leg.
6. Inward rotation of the tibia upon the femur.
7. Inward rotation of the tibia and the fibula upon their own axes.

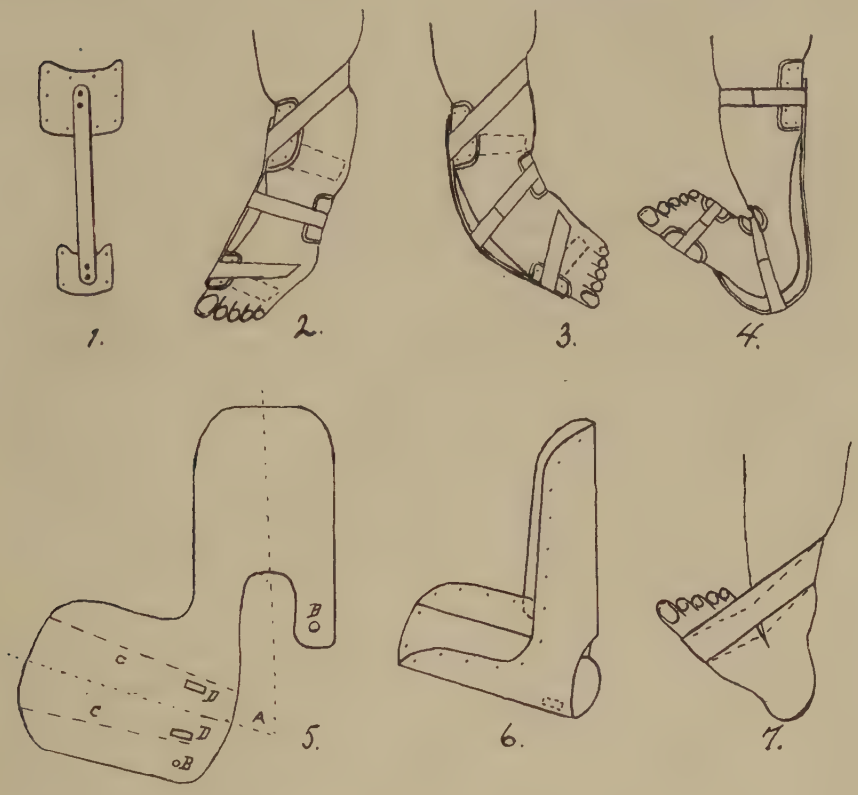

Fig. 1. Judson club-foot splint, unpadded.
Fig. 2. Judson splint, padded and applied; first position.
Fig. 3. Judson splint; varus corrected.
Fig. 4. Modified Judson splint for correcting the equinus while maintaining the correction of the varus.
Fig. 5. Pattern for Schapp's retention shoe. A—angle of dorsal flexion. B—rivet holes, one rivet only required. C—broken lines mark limits of sole. D—slots for padded strap over dorsum of foot.
Fig. 6. Schapp's retention shoe; dots mark perforations for attachment of padding.
Fig. 7. Jones' method of strapping to maintain extreme over-correction.

Requirements of Treatment.—The important requirements of treatment during infancy, may, in my opinion, be stated as follows:—

(1) Over-correction should be secured *gradually by non-operative*

methods, yet as *rapidly* as is consistent with the health and comfort of the infant. Gradual over-correction is preferable, because it can be secured without risk or special discomfort to the little patient. As regards non-operative measures, it will hardly be denied that, with the same degree of correction, the functional results thus obtained will usually be better than those following other than the most simple operative procedures. Incidentally also, gradual, non-operative methods are much preferred by parents. "Gradual," however, does not mean slow, and no good reason can be adduced for dallying with treatment and stretching out the corrective stage over many months when two or three should suffice. Having analyzed the deformity and determined upon the methods indicated, the surgeon should bring the foot into the over-corrected position as early as possible in order that advantage may be taken of the rapid growth of the first months.

(2) Patients must be treated individually, according to the character of the deformity present. Cases differ markedly, since the various elements of the deformity (mentioned in the working analysis) are present in varying degrees; pronounced varus may exist with but slight equinus, or, on the other hand, the contracted tendo Achilles may offer almost the only resistance to immediate correction; the bending at the medio-tarsal joint may be so extreme in one case as to present a deep furrow, while in another the foot itself, although inverted, may be of almost normal contour. In some cases the inversion of a small, poorly developed heel may offer considerable difficulty, while in others a marked twist in the tibia and fibula, possibly unrecognized at first, may finally be found to explain a persistent in-toe; and so on.

(3) Extreme over-correction must be the rule. It is surprising to occasionally still read in current literature statements to the effect that the foot should be put up in "a slightly over-corrected position." The failure to secure sufficient over-correction is certainly the cause of very many of the partially cured cases that one meets. To be *cured,* a club-foot must have the same range of motion as the normal foot, and since it is necessary to allow a margin of relapse, it follows that only by securing extreme over-correction can we hope to obtain a cure. "If perfect correction it attained, relapse is exceptional."* The danger of producing a flat-foot by too energetic treatment is not great and is certainly unlikely to occur when cases are treated individually.

(4) Persistence in after-treatment is a necessity. Too often the physician evidently believes that he has discharged his duty when he has corrected the deformity and applied a walking brace, the fitting of which is unfortunately often left to the instrument maker. *After correction comes restoration of muscle balance,* and the latter requires as skillful attention as the former. Not until the patient can actively over-correct the foot is the object of treatment attained, and even then parents must

*Bradford and Lovett (*Orthopedic Surgery*, 1905, p. 525).

be warned of the possibility of late relapse and taught to watch for slight degrees of limitation of motion,—the first sign of beginning relapse.

Requirements of Methods and Appliances.—The variety of methods and appliances used in the treatment of club-foot is usually most confusing to the layman. He consults one surgeon who always uses plaster-of-Paris, a second who advocates a certain brace, a third who employs some other form of apparatus, and so on. It is hard for the layman, and also apparently for many physicians, to understand that the principles underlying the various methods and appliances are the same and that any dressing or apparatus which acts in accord with these principles, if properly used, will give the desired result, while an equally good result may be obtained in several ways. In judging the value of any special dressing or appliance, it should be considered from three standpoints. (1) Efficiency. It must fully meet the requirements of the case at that particular stage. (2) Simplicity. The simpler the appliance, other things being equal, the better, since simplicity makes for procurability, cheapness and ease of application. (3) Adaptability (a) to the patient and (b) to the surgeon. It must be suited to the age of the patient and the local condition of the parts, and should not demand unusual mechanical skill of the surgeon.

Methods of Treatment: Stage of Correction.—With few exceptions orthopedic surgeons agree that the varus element of the deformity should be corrected before anything is done with the equinus. The chief reason for this is the simple mechanical one of better leverage, since as long as the contracted heel cord persists we have its resistance to work against in abducting the fore part of the foot; a lesser reason is that correction of the equinus is as a rule easy, while the varus presents the chief difficulty. Occasionally, the equinus is the chief factor in producing the varus, in which event it naturally becomes the primary object of attack. Taking up then the actual course of procedure for the average case, I shall describe that which at present seems to me the simplest and the most satisfactory.

Correction of the varus, the first step, is accomplished by manipulations without anesthesia, repeated at short intervals, and by retention with the Judson splint.

In carrying out the manipulation it is *important that the different elements of the deformity be treated separately.* All manipulative measures must necessarily be carefully graduated to the size of the parts and the sensibility of the patient, with few exceptions partial correction only being attempted at one sitting and only so much being secured as is possible without traumatism or undue pain. In my opinion, however, *sittings should be at much shorter intervals than is generally the case,* every two to five days if possible, in order that complete correction may be very early attained.

Attention is first directed to the deformity in the foot itself and especially to that located in the medio-tarsal joint. The surgeon, sitting facing the child, grasps the heel and ankle with the left hand and the fore part of the foot with the right, these parts in the infant being easily held between the thumb and fingers; the fore part of the foot is then bent forcibly outward (horizontal plane) to correct the adduction, next pushed upward to flatten the sole and so overcome the cavus, and finally twisted outward to correct that part of the inversion located at the mid-tarsus. Turning next to the deformity in the posterior part of the foot and at the ankle, the grasp of the left hand is shifted upward so as to better protect the epiphysis from injury, while that of the right moves backward to include the heel, which is held between the thumb and fingers; the heel is now forcibly everted, and next the whole foot is rotated outward at the ankle. If any one element is present to an unusual degree, it is better to treat it alone for a few sittings, as for example, in case of a marked angular bend at the mid-tarsus the deformity in the posterior part of the foot and at the ankle should be disregarded for a time in order that its resistance may be made use of in abducting the front of the foot and also to avoid the danger of too great overcorrection of the lesser elements. Twisting of the bones of the leg, if present, may be treated by grasping the bones firmly at the epiphyses, so as to protect them from injury, and forcibly rotating the lower portion on the upper. Manipulation of the equinus is at first disregarded, as has already been stated. When all the correction advisable at a given sitting has been secured, the splint is applied, or if this is not at once available, the amount gained may be retained by adhesive strapping after the method described later.

Judson's club-foot splint* (Figs. 1-3) consists of a narrow metal upright (of soft iron or brass), to each end of which is riveted a thin metal plate (of tin, aluminum or brass); in young infants the upright will usually be about four or five inches long, the upper plate one and a quarter to one and a half inches square, and the lower three-quarters to an inch square; the plates are perforated for the attachment of padding (a half thickness of sadler's felt is very satisfactory); a third unattached padded plate is used by Judson over the outside of the ankle but the felt alone is quite sufficient. This most excellent and useful appliance is simply a lever of the third class. It has the same mechanical action in this stage of the deformity as the plaster cast, but is lighter, is more easily applied to the small foot of the infant, retains its position better, is less likely to produce pressure sores, and can be readily removed by anyone should necessity arise.

The splint may be readily bent with a pair of pliers. In the different stages of the correction of the varus the inside of the leg and foot is first concave, then straight, then convex; the upright is always given

*Judson, A.: Growth and Deformity, 1905, p. 6.

a little less curve than that of the leg and foot, so that there will be a free interval between the two; as the curve changes from concave to convex, a longer upright becomes necessary. The upper plate is shaped to fit the inside of the leg near the head of the tibia, and the lower to fit the inside of the foot at the great toe joint. The splint may be applied with three circular strips of adhesive plaster, but a diagonal application of the upper and lower strips seems to me preferable, since when thus applied the brace is prevented from slipping down off the foot and there is no danger of constriction; in this method the upper strip, about an inch and a quarter wide and five or six inches long, starts on the outside of the knee, passes diagonally downward and inward across the upper plate, and then outward to end on the outside of the calf; the lower, about an inch wide and two or three inches long, starts just below the outer malleolus and runs in a similar manner across the lower plate to end on the outer edge of the sole. The middle circular strip is first given a turn around the upright and then carried several times around the ankle, which is protected by the felt pad, and the upright; when applied, it should still be possible to bring the leg closer to the upright by moderate pressure on the two between the thumb and fingers, else the pressure may be sufficient to irritate the child or even to cause a pressure sore over the great toe joint; if the upright stands off sufficiently from the leg, moreover, the attendant may be allowed to take up the slack each day by applying an additional circular turn over the preceding one, thus securing more rapid correction. A gauze bandage completes the dressing. When dressings are changed, both during the correction of the varus and subsequently during the early course of treatment, it is advisable not to allow the foot to draw back into the old position, since if this is permitted at each sitting, retraction of the lengthened tissues, which is as important in the establishment of a cure as is stretching of the contracted tissues, is delayed.

Manipulation and retention should be continued in this manner until a position of extreme valgus has been reached; this step in treatment should be accomplished in from two to six weeks in practically all cases seen soon after birth. The position of extreme valgus is then to be maintained, while the correction of the equinus, the next step in treatment, is begun.

Correction of the equinus may be secured by means of a slight modification of the splint just described, by plaster-of-Paris casts, by adhesive strapping in the milder cases, or by tenotomy.

In using the splint for this purpose (Fig. 4), its position is changed to the back of the leg; the upright, which must now be considerably longer, is bent to conform to the contour of the back of the leg and the sole when the foot is in the position of greatest possible dorsal flexion, a free interval between the two being necessary here also, especially at the heel; the upper plate presses against the calf, while the lower, which

must also be larger, grips the anterior half of the sole, this being given any desired degree of eversion by simply twisting the upright; the splint is secured with adhesive plaster in a similar manner to that already described, the middle strip passing over a pad placed in the fold at the ankle. Correction of the equinus is thus carried out by manipulation and retention with the splint in an exactly similar manner to that described for the varus. Plaster-of-Paris casts, or in mild cases adhesive strapping, may also be used after the methods to be described later. When the varus is fully over-corrected, tenotomy may be employed after about the third month in extreme degrees of equinus, in resistent cases, in cases in which the force necessary to correct the equinus would produce an undue flattening of the arch, or in those in the later months of first year where is seems advisable to hasten correction. The operation is such a simple one, no anesthetic being required in the earlier months; and results, under proper precautions, are so uniformily good that one should not hesitate to employ it in cases which do not yield readily to non-operative methods.

Stage of Retention.—When full over-correction has been attained, the second stage of treatment, the stage of retention, begins. For this there is nothing superior in the average case to a plaster-of-Paris cast. The question of how high the cast is to be applied is, in my opinion, the important one. If it be carried only to the knee and if any tendency for the foot to rotate inward be still present, a certain amount of such rotation will inevitably occur, for there is nothing to prevent the straight cylinder-shaped leg portion from turning. If, however, the cast be carried above the knee with the joint slightly (15-20°) flexed, rotation cannot occur, for, as soon as it begins, the inner thigh portion of the cast is forced against the thigh. The early casts at least, therefore, should always be carried above the knee. It is desirable that the knee be flexed only enough to prevent rotation, for if flexed acutely, the gastrocnemius portion of the calf muscle will not be sufficiently stretched.

In applying the cast, the following technique will be found serviceable. For padding, ordinary sheet wadding, cut into strips of two or two and a half inches in width and rolled in bandage form, is excellent; the plaster bandages should be of the same width and are most convenient if made only three yards long instead of the usual six. After powdering the parts and applying pledgets of cotton between the toes, the foot and leg are bandaged firmly with several layers of the sheet wadding, moderate correction being meanwhile maintained. In applying the plaster bandages, the most satisfactory method that I have yet tried is to first apply a collar around the fore part of the foot*; as this sets, it is flattened out by being grasped between the thumb and fingers, and the fore part of the foot is thus given a proper shape, and constriction and distortion of the toes prevented, further freedom being also secured later

*Ehrenfried (*Boston Med. and Surg. Journ*, Vol. 161, p. 741, 1909).

when the pledgets of cotton are removed. In applying this collar it is well not to carry it too far up on the dorsum of the foot, else later when the foot is dorsal flexed during correction the hardened upper edge of the collar may be forced into the fold at the ankle and sufficient pressure be produced to cause a slough; it is also well to carry one turn around the heel so as to prevent the collar from slipping forward. After the collar is finished, that part of the cast above the ankle is put on, the bandage being started just above the malleoli; just before finishing the thigh portion of the cast, the sheet wadding is turned down over the upper edge and caught in place with a few turns, thus protecting the skin from the rough edge of the plaster; the same procedure should be carried out at the distal end of the collar. When the two portions are sufficiently set, a bandage is applied around the ankle to join them, the hardened collar enabling one to exert all the force in correction that is desirable.

A distinct advantage of the cast is that it may be left undisturbed for from four to six, or even eight, weeks, depending upon the cleanliness of the patient, thus affording the most perfect conditions for retraction of lengthened tissues; after two months the foot will usually be found in condition to permit the application of a short cast or of a simple retention splint.

In suitable cases over-correction may be advantageously maintained by adhesive plaster strapping after the method of Jones* (Fig. 7): while the foot is held in a position of extreme dorsal flexion and eversion, a strip of adhesive plaster is applied in a circular manner around the fore part of the sole and the back of the ankle. A somewhat smoother application may be made by using separate strips for each side; the extreme position being maintained, the first strip is carried from the inside of the great toe joint outward under the ball of the foot, and then upward above the outer malleolus and across the back of the leg; a second strip is applied in a similar manner on the opposite side; a third strip may also be used overlapping the first but nearer the heel. Jones' simple method has yielded me most excellent service in maintaining the extreme degree of over-correction desirable before the walking period, and I can heartily recommend it.

Where the degree of correction attained is not sufficient to permit the use of this method, or when the walking period has been reached, the following technique may be used: with the foot held in the best position, a strip of adhesive, about one and a half inches wide, is carried from the inside of the great toe joint outward under the fore part of the sole and then up the outside of the ankle and the back of the calf; a second strip is started in a similar manner, overlapping the first, but is carried across the front of the ankle and up the inside of the leg; the two strips are then bound down to the ankle by a circular strip passing two-thirds

*Jones (*British Med. Journ.*, 1909, p. 1065).

of the way around the leg. (See also Soule's method, *Amer. Jour. Orth. Surg.*, Vol. VIII., No. 4.)

After the foot shows a tendency to maintain the over-corrected position, constant retention may be discontinued and recourse had to the use of a simple splint during the night and for a varying period during the day, to massage, and to manipulation by the attendant. Where treatment has been instituted early, I have not found it necessary to use complicated club-foot shoes, but have secured most satisfactory results from simple appliances, such as that of Schapps.* (Figs. 5 and 6.) Full freedom of the foot is permitted for a gradually increasing period. Massage, chiefly kneading, is practised by the mother or nurse once daily and manipulation twice daily. Any tendency to relapse may be promptly met by short periods of adhesive strapping. Usually by the fourth to the sixth month the foot retains the corrected position easily, the mother has learned the rules for home treatment, and visits may be reduced to one or two a month.

Stage of Supervision.—Supervision must be continued from the time the foot easily retains the corrected position until its use in walking has demonstrated the permanency of the cure. During this time massage and manipulation, and the use of the night brace are continued. Development of the peroneals may be favored by causing the child to abduct the foot through tickling the sole and through games. A close watch must be kept for any signs of relapse.

When walking is begun, special attention must be paid to securing proper shoes. It may be advisable to thicken the outside of the heel or sole, or both, although in many cases I find that the patients walk much better in a very soft shoe, such as a moccasin.

Treatment of Cases Presenting During the Latter Months of Infancy.—The nearer the walking period, the more one is inclined to adopt the method of choice for the older cases, namely, forcible correction under an anesthetic with the application of a plaster-of-Paris cast, since it is important that the foot should be in a corrected position before walking is begun. The same method is preferred in the younger cases coming from a distance that are unable to devote the time required for gradual correction.

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*Schapps (*Northwestern Medicine*, Vol. VI., No. 11, 1908).

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ON THE MANAGEMENT OF CHILDREN PREDISPOSED TO NERVOUSNESS.*

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Whether a person becomes nervous or not depends upon two great factors: (1) the constitution which he inherits from his parents and through them from his ancestors generally; (2) the influences to which his body, especially his nervous system, is exposed during life and particularly during childhood. There will always be differences of opinion among serious students of the subject as to the relative importance of these two factors; some assume that heredity or nature is the all important factor; others maintain that this is relatively insignificant and that environment or nurture accounts for everything; both views are one-sided. Both nature and nurture are of fundamental importance and only by considering the two aspects of the subject fairly can sound ideas ever be arrived at.

Heredity and environment overlap in one period of life; during early childhood the individual is usually under the educational influence of his parents and exposed to their example. Doubtless much that is sometimes attributed to direct inheritance is really due to the influence after birth, of imitation of the parents. Where the heredity is notoriously bad, it might be well, as Oppenheim[1] suggests, to protect children, who have the ill-fortune to be born under such conditions, from the dangers of psychic infection in the parental environment; such children taken away from home and placed under more favorable conditions would have a better chance of counteracting the faults of inheritance.

In families in which nervous states prevail, it is a matter of great interest to know in how far the nervous tendency can be overcome by educational means and especially to learn what to avoid because of its likelihood to injure the nervous system. Even in families in which no nervous taints exist in the parents or near relatives, the children sometimes become nervous through faulty education and there is a growing desire on the part of well-informed people nowadays to make sure that the means of education they provide for their children shall be such that the nervous system will be protected and strengthened rather than exposed to overstrain and injury.

*Read before the Public Health Congress of the Medical and Chirurgical Faculty of Maryland, February 10th, 1911. This paper will also be published in the *Bulletin of the Medical and Surgical Faculty* of Maryland.

One fact, which has become ever clearer as medical knowledge has advanced, concerns the nutrition of the child. Faulty feeding in infancy and early childhood may lead to such impoverishment of the tissues and such stunting of growth that the ill effects can never be recovered from in later life. A considerable proportion of the intellectual and moral inferiorities among our people is fairly attributable to imperfect nutrition at this early age. Fortunately the public is now being so thoroughly educated to the importance of breast-feeding for infants and of liberal and suitable diet during the early years of life, by family physicians and also through the excellent little manuals of Holt,[2] Starr,[3] Griffith[4] and others, on the care and feeding of children, that it is not necessary to dwell at length upon the subject. Plenty of good, simple food, including milk, meat, vegetables and fruit, with avoidance of condiments, coffee, tea and alcohol is approved by all authorities.

Many parents make the mistake of allowing the caprice of the child to influence its diet. We now know the foods that are suitable for children, and, knowing these, the children should be provided with them in suitable amounts and should be required to eat of them, largely independent of choice. The child that learns to eat and digest all wholesome foods and who is not permitted to cultivate little food antipathies makes a good start and avoids one of the worst pitfalls of life with which medical men are very familiar, namely, a meticulous anxiety concerning the effects of various foods, all too likely to develop into a hypochondriacal state.

There is a greater recognition now than formerly, also, of the fact that children should not be too tenderly brought up—that a certain amount of judicious hardening of the body is desirable. While faddists and extremists in this direction fall into grievous errors, making their children go barefoot and barelegged in the snow and compelling the feeble, nonreacting child to take plunges in ice-cold water, a still greater mistake is made by those who over-protect their children and who fail to accustom their bodies early to cool baths and to exercise in all sorts of weather.

The child who is brought up in such a way that he is very sensitive to slight changes in temperature is bound to suffer from it sooner or later, and everyone is familiar with those who grumble at the weather. If children be suitably dressed and are early accustomed to taking a cool bath in the morning and to walks out-of-doors every day, rain or shine, and whether it be cold or warm, the skin and nervous system quickly acquire a tolerance for variations in temperature most desirable for health and for the feeling of well-being.

An out-of-door life for children also leads them unconsciously to exercise their muscles more than is possible for the child who stays indoors. Not only physicians, but also laymen from the old Greek times to the present have been impressed with the importance of bodily exercise and harmonious muscular development for the welfare of the mind and of the

nervous system. If we wish our children to be strong, energetic and courageous, if we desire to insure them against the nervous ills which follow in the wake of debility, inertia and timidity, we must see to it that all the muscles of their bodies are systematically and regularly exercised. For this purpose the plays of children are very important and the only child, deprived of the companionship of brothers and sisters, unless pains are taken to supply other playmates for him, is much to be pitied. Besides play, walking, running, rowing, riding, swimming, paddling and sailing are all desirable forms of bodily exercise. In cities, and especially during the school year, systematic gymnastic exercises, calisthenics, have to be resorted to and where no suitable gymnastic exercises can be obtained, parents will do well to teach older children some forms of exercises to be taken in the early morning. One of the best of the various systems worked out is that of a Dane, one J. P. Müller[5] who, in his little book, "My System," outlines a series of exercises which anyone may carry out in his own room without apparatus. These exercises are physiologically well-devised, and I can recommend them heartily, not only for older children, but also for both men and women who have to compress the exercises of the day into a very short period. The exercises recommended in this country by Luther Gulick,[6] by Tait McKenzie,[7] and others may also be mentioned. I would call attention also to the works of Lagrange.[8]

An anxious mother will often ask to have her nervous child excused from regular exercises at school. This is usually a mistake, for nervous children even more than normal children, require systematic muscular exercises. It should, of course, be properly regulated, and where there is any doubt as to the reliability of the supervision of such work at a school gymnasium, definite instructions should be obtained from the family physician as to the character and amount of exercises to be undertaken.

While emphasis is thus laid upon suitable bodily exercise for children predisposed to nervousness, a warning should be sounded against excesses in sports like tennis, foot-ball, basket-ball and other games in which there is opportunity for competition or rivalry. Over-ambition in these directions is often most harmful both to the body and to the mind of the child and should be especially avoided where there is any neuropathic taint.

In addition to the hardening of the body, the education of the child should include measures which increase the resistance of the child against pain and discomforts of various sorts. Every child, therefore, should undergo a gradual process of "psychic hardening," and be taught to bear with equanimity the pain and discomfort to which everyone sooner or later cannot help but be exposed. What I have said about clothing, cold baths, walking in all weather and at all temperatures, play and exercise in the open air, has a bearing on this point, for a child who has formed good habits in these various directions will have learned many lessons in the steeling of his mind to bear pain and to ignore small discomforts.

Physicians who work among nervous cases realize how often the child who has been too much protected from pain becomes the victim of nervous break-down later in life. I have seen many a woman who could bear great sorrow or suffer without flinching the pain of childbirth, who still had no tolerance for the little ills of life. In such cases, it is the idea rather than the sensation from which the patient suffers, and such abnormal ideas most frequently arise in those who have not learned in childhood to bear pain well or to adjust themselves without complaint to the disagreeable sensations and experiences which are essential to a normal bringing up.

The boy, who learns to tumble in a gymnasium, to stand the pain of boxing and fencing and wrestling and to keep his temper while engaging in these exercises, will have subjected himself to a training which cannot help but stand him in good stead later on in life. One reason why women are more prone in later life to nervousness than men, may lie in the lessened opportunity which girls have for bodily and psychic hardening in the games which they play and the life which they lead as children. Particular care should be taken with young girls who show any tendency to nervousness to see to it that not too much concession is made to their likes and dislikes. Nothing can be more harmful to them than the gratification of caprice. Especially when a child shows a tendency to be nauseated by certain smells and tastes and to complain of noises or of sensitiveness to bright light, the family physician should be consulted and, provided no actual disease of the sense organs or brain is responsible, the process of psychic hardening should at once be begun.

Neglected, it is surprising to what vagaries such hypersensitiveness may lead. A lady recently consulted me on account of a most distressing state, asking that "in the name of mercy and pity" she should be given some help and told how to overcome an obsession which distressed her. The sound of her husband chewing at table completely upset her, and when he smoked, the noise made by the puffing of the smoke was torture to her; the creaking of her mother's shoes as she walked about the house made her most uncomfortable during a period of several months. Obviously the abnormal idea in such a case caused the suffering, not the sensory impulse itself.

Another patient, a gentleman, who has had repeated nervous breakdowns, told me that they always begin in the same way. After a night of insomnia he will suddenly become unable to bear a strong light, and in lamp-light he complains that he has a sensation of pressure in the head and an inability to relax his limbs. He feels at such times as though he will lose his mind and that he must have some relief or he will have to end his life. In one of these attacks in early life, he stayed two years in a dark room and only at the end of that time would consent to remain in the light. Obviously here, too, it was not the sensation of light but the idea that the light would injure him which was the kernel of his condition.

Examples like the two just mentioned could easily be multiplied, but they will be sufficient to indicate the direction in which the psychopathic nervous system may easily tend. While in severe cases like these just referred to, the patients undoubtedly started out in life with abnormal nervous systems, it is quite conceivable that a judicious hardening in early life might have prevented the later shipwreck. I cannot too strongly recommend, therefore, the acquisition of tolerance of disagreeable feeling-tones as early as practicable in life.

If children can be brought to behave normally in the presence of the disagreeable feeling-tones just discussed, the task of educating them to control themselves in circumstances which tend to arouse the stronger feelings, emotions and passions will be made much easier. Parents and nurses are too little aware of the dangers of allowing the emotions or passsions to go unbridled. The problem should be recognized and attempts at the beginnings of its solution should be made in early infancy. If a young infant be kept in a normal routine, despite any emotional outbreak which it may manifest, an excellent start in the training of the emotions will have been made. If a child learns, that, by crying or by an exhibition of temper, it can gain the thing which it thinks desirable, otherwise unattainable, a very bad start will have been made. Children should early be given to understand that they must control themselves before their desires will be gratified. How often has an indulgent mother given a child something it has asked for in order to stop its crying and to avoid a scene! It is hard to imagine anything, in the circumstances, worse for the child. If, instead, the mother had ignored the temper and told the child that it must say "please" and must wait a few moments after its temper has been controlled and the request has been made before the desire will be gratified, it would have been quickly possible to convince the child that it can get things by controlling itself rather than by emotional explosions. The substitution of self-mastery for emotional outbreaks is easy when begun early, but very difficult, indeed, well-nigh impossible, if begun late in life.

Another mental attitude that bears watching is the craving of the child for sympathy. Parents are really unkind in yielding too much to such a craving. True kindness will teach the child to rely more upon self-help.

Still another manifestation, common in children and fostered too often by the example of the parents, is vacillation. In one form of functional nervous disease indecision is a most prominent symptom. Parents should see to it that children are not exposed to a pernicious example in this regard. While there are some children of the "hair-trigger" type, who have to be taught deliberation in the making of decisions, there are more who have a tendency to doubt and indecision and who should be taught that it is better, after due consideration, to make a decision, even though it be wrong and to stick to it, rather than to remain undecided.

The extent to which the fallacy of indecision may be carried is well manifested by some of the psychasthenic patients who apply to physicians for aid. Their indecision is often shown by the way in which they make an appointment with the physician, making and breaking it several times or changing the hour repeatedly before finally appearing in his office. One of these patients told me that it sometimes took him hours to decide what clothes to put on for the day. Fortunately, such pathological cases are uncommon, but there is every gradation from the milder symptoms of vacillation to the outspoken and distressing indecision of the confirmed psychasthenic. The old motto "When in doubt, act," should be kept in mind by parents who note a tendency to indecision in a child.

The control of the stronger passions is for some easier than the mastery of ordinary irritation, and nervous children should, both by example and by precept, be taught how to stifle irritability whenever it arises. So few adults have learned how to meet the daily friction that there would seem but little chance as yet for the nervous child constantly exposed to a bad example. As an observant writer has said, "an important feature of the art of living consists in keeping the peace, the whole peace and nothing but the peace with those with whom one is thrown."

If parents are prone, in their daily lives, and especially within hearing of children, to blame the people who surround them or the people about whom they talk, they may often, quite unconsciously, sow the seeds of malevolence in young minds. Just as cheerfulness and kindliness are contagious, so, unfortunately, are moroseness, acerbity, churlishness and ill-will, and the latter are mental states which are most harmful to the nervous system. It is entirely possible, with long training, practically to banish anger, worry, irritability and uncharitableness from one's life. You will be impressed with the passage in Arnold Bennett's book, *The Human Machine*,[9] which deals with the matter of blaming, of judging others, and emitting verdicts upon them. You may not agree with him, but he will make you think, at least, when he says: "All blame, uttered or unexpressed, is wrong. I do not blame myself. I can explain myself to myself. I can invariably explain myself. If I forged a friend's name on a cheque I should explain the affair quite satisfactorily to myself. And instead of blaming myself, I should sympathize with myself for having been driven into such an excessively awkward corner. Let me examine honestly my mental processes, and I must admit that my attitude towards others is entirely different from my attitude towards myself. I must admit that in the seclusion of my mind, though I say not a word, I am constantly blaming others because I am not happy. Whenever I bump up against an opposing personality and my smooth progress is impeded, I secretly blame the opposer. I act as though I had shouted to the world: 'Clear out of the way, everyone, for I am coming!' Everyone does not clear out of the way. I did not really expect everyone to clear out of the way. But I act, within, as though I had so expected. I

blame. Hence kindliness, hence cheerfulness, is rendered vastly more difficult for me.

"What I ought to do is this! I ought to reflect again and again, and yet again, that the beings among whom I have to steer, the living environment out of which I have to manufacture my happiness, are just as inevitable in the scheme of evolution as I am myself; have just as much right to be themselves as I have to be myself; are precisely my equals in the face of Nature; are capable of being explained as I am capable of being explained; are entitled to the same latitude as I am entitled to, and are no more responsible for their composition and their environment than I for mine. I ought to reflect again and again, and yet again, that they all deserve from me as much sympathy as I give to myself. Why not? Having thus reflected in a general manner, I ought to take one by one the individuals with whom I am brought into frequent contact, and seek, by a deliberate effort of the imagination and the reason, to understand them, to understand why they act thus and thus, what their difficulties are, what their *explanation* is, and how friction can be avoided. So I ought to reflect, morning after morning, until my brain is saturated with the cases of these individuals. Here is a course of discipline. If I follow it I shall gradually lose the preposterious habit of blaming, and I shall have laid the foundations of that quiet, unshakable self-possession which is the indispensable preliminary of conduct according to reason, of thorough efficiency in the machine of happiness."

The growing child will nearly always find himself confronted by a sufficient number of disagreeable excitations to give him opportunity for the cultivation of emotional control. It is not desirable that life should be arranged otherwise for him; it would be far from advantageous to him to be protected from everything tending to stir his feelings and emotions. Attempts to follow the founder of Buddhism in the idea of educating youth by suppressing desire and keeping the individual from the sight of suffering, care or sorrow, would lead to a race of weaklings insufficient for the struggle of life. Far better, as Ziehen[10] and Oppenheim recommend, purposely to expose the neuropathic child occasionally to opportunity for slight emotional outbreak in order that he may by a sort of "gymnastic" of the emotions gradually learn to be master of himself.

The sensitive nervous system, if over-protected in the early years, suffers keenly when later on the principle of protection has, perforce, to give way to the principle of exertion. A lady of great refinement, who, owing to an illness which necessitated hospital treatment, was unpreparedly made aware of the world-pain which exists and of which she had previously known but little, owing to her mode of life, once told me how the sudden contact with suffering humanity affected her. "I saw and heard so much that distressed me, that *all life seemed to be an open wound.* * * * I used to lie awake all night, thinking about what

I had seen or heard or suspected during the day, and *I thought I should go mad* because I could do nothing to stem that rising tide of misery and corruption." Fortunately, she was made of excellent stuff and so profited by the chastening experience that, on recovery, she joined a group of enthusiastic social workers and now labors earnestly to improve human conditions in the city and state in which she lives.

Special care should be exercised to prevent disagreeable feelings and emotions becoming transformed into the more persistent moods. It is often better for an emotion to discharge itself in the form of some definite act and thus bring it to an end rather than through the partial suppression of it, have it last in the form of a disagreeable mood, for a considerable length of time. Pouting, sulkiness, harboring a grudge, or bearing malice, should be regarded as symptoms seriously to be considered and corrected, for if they be tolerated in the child, habits may be begun which will prepare the soil for the development, later in life, of the seeds of enmity and suspicion; the full grown plants are the persecutory ideas of the paranoiac states.

How to manage a child in a fit of temper has been much discussed. When possible it is desirable to cut it short at the beginning. Some parents rejoice to see their children reveal a violent temper, and are glad that they can fly into a passion, turn red as a beet, clench the fists and attack the individual with whom they are angry. Such attacks, if frequently repeated, are very deleterious to the nervous system. Some parents try to stop them by petting or indulging the child, a kind of licensing of irritability which rarely, if ever, pays; others threaten the child or corporally punish him, a mistake, usually in the other direction. As a rule, most may be accomplished by purposefully ignoring the attack, perhaps isolating the child for a short period; in some cases a warm bath and the bed may be the best remedies! In older children the habit of giving way to temper may sometimes be broken by inculcating the conviction that one who loses his temper makes a fool of himself, loses his dignity and excites the disdain and contempt of his fellows: the horror of looking ridiculous, of making a donkey of oneself, may be a most powerful lever in conquering a tendency to attacks of fury.

All children are easily frightened, but the child predisposed to nervousness, more easily than the healthy child, becomes the victim of abnormal fears or timidity. The Italian physiologist, Mosso, writing on "fear"[11] once said: "Every ugly thing told to the child, every shock, every fright given him, will remain like a minute splinter in the flesh, to torture him all his life long." In Greece and Rome the children were frightened with the lamias or female demons, who would charm them and suck their blood, with the one-eyed Cyclops or with a black god, Mercury, who would come to carry them away. And this very pernicious error in education still prevails. The mother, the nurse, the maid and the servants still frighten the child with tales of the bogey-man, of goblins,

of ogres, of wizards and of witches. How often is a child frightened to tears, its disposition spoiled and its life made a burden by tales, threats or tortures which make it timid and shrinking; sometimes fears are thus started which last through life. One must learn how to deal with the fear of being alone, the fear of the dark and the fear of thunder and lightning. Certain fears, common to childhood, are easily overcome, especially through the example of courage set by parent, nurse or teacher.

In some instances, however, the fears are a symptom of disease and when there is doubt a physician should always be consulted. A young girl, recently brought to me, because of an unaccountable, persistent, and distressing fear of "burglars in the house," was found to be suffering from exophthalmic goitre; on removal of a portion of the thyroid gland by Dr. Halstead the child rapidly improved, and on last report was only occasionally troubled by the fear; it seems probable that she will soon be entirely free from it. Children who suffer from "night terrors" often have adenoid growths in the nasopharynx; on removal of the growth by a slight operation, the "night terrors" disappear.

In his book[12] entitled *The Natural Way in Moral Training,* Patterson DuBois emphasizes the importance of what he calls "nurture by atmosphere," by which he means the indirect education of the feelings, and John Dewey[13] asserts that "the feelings and sentiments are the most sacred and mysterious part of the individual, and should always be approached and 'influenced indirectly.'" More can be accomplished by the setting of good example in enthusiasms, depreciations, reverence, and admirations, than by direct preachings.

Let no one think, however, that lack of feeling, or a nature impoverished on the emotional side is desirable, or that it protects against nervous disease. The elevating emotions, hope, joy, expectation, love—are constructive and are judiciously to be cultivated; the depressing emotions—despair, sorrow, regret and fear—are damaging to the nervous system if long maintained. The highest feelings of all, including the religious, the ethical and the esthetic—inspire noble and useful conduct, and in the education of nervous children these sentiments are to be favored in their development, in due degree, at a suitable age.

It is a serious mistake to lead the young child into experiences that belong properly to a later age. When children under ten years of age are made to travel extensively, to visit museums and picture galleries, to attend the theatre and the opera, they are introduced to entertainment wholly unsuited to their time of life and which they, in their immaturity, are entirely unfitted to enjoy. Later on, at an age when they should learn to know such things for the first time, the attractiveness of novelty is wanting; they are cheated of the pleasures which normally should be theirs. As Oppenheim well puts it, a "child's childishness is its greatest asset."

On the training of the religious, ethical and esthetic feelings, time will

not permit me to speak, though I regard the topics of the greatest importance for the health of the nervous system. Certainly, the cultivation of the love of nature, of truth, of goodness, of beauty, and of humanity, cannot help but strengthen the character and the will. The altruistic feelings, when they begin to appear, should be given opportunity for expression.

Above all, as a factor making for the health of the nervous system, the joy of work[14] must be referred to. It is one of the greatest pleasures life offers; moreover, it compels concentration of attention, and protects from all the dangers which attend upon idleness. "Education to idleness is education to .nervousness." Overwork must be avoided; neither bodily or mental fatigue should be permitted in excess. Regular, systematic, enjoyable work, suited to the interests and powers of the worker, is the best tonic I know of. If the work can be in the country, rather than in the city, all the better, especially for those with nervous predisposition. The enjoyment of nature possible in the country, the opportunities for work in wood, field or garden and upon the river, keeping the worker much in the open air, exercising his muscles, drawing his attention away from himself and fixing it upon things ontside—what conditions could be more favorable to the health and happiness of the nervous child. If the nervous children that we see in towns could be transplanted to villages and the country—away from the din and bustle of the city, its restlessness, its haste and its feverish excitements, what a host of advantages would accrue! The schools are growing ever better in the country; in many country districts they are now excellent. The movement which began with the New School of Dr. Cecil Reddie[15] in Abbotsholme, England, and which has led to the Landerziehungsheime of Lietz[16] in the Harz and in Thuringia, and of Trueper[17] near Jena, should be followed and imitated in this country.

In any case, nervous children should not be sent to school too early; preferably they should start a year or even several years later than the normal child. And in the schools they should never be pushed ahead too fast; competition is dangerous for the nervous child. The mistaken ambition of parents who desire their children to head the class is often responsible for serious injury to health.

Sleeplessness is always a dangerous signal. In children it is most often due to indigestion or to mental overstrain; occasionally to premature sexual excitations. If insomnia appear and especially if it persist the parents should consult a physician.

Medicine, psychology and pedagogy are all concerned in solving the problem presented by the nervous child. These sciences have already made great conquests; what the future may hold for them, who will attempt to foretell? Let us avail ourselves of the knowledge we have, doing what we can to dispel the scepticism of the ignorant and at the same time avoiding the futile enthusiasm of those who believe they know all.

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CHRONIC HYPERSECRETION.*

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At the outset I desire to emphasize, as a cardinal point, the necessity of viewing every patient with chronic hypersecretion as an initial case of gastrectasis; also, to stress the fact that the primary cause of the hypersecretion be carefully looked for with the object of instituting early and proper treatment. By this means, we minimize the possibility of dilation of the stomach, which is likely to supervene if the primary disease is located at the pylorus, and is neglected. That intermittent, or periodic hypersecretion is, at times, due to a nervous affection is true—but chronic hypersecretion, never; it is "merely an expression of an organic lesion of some part of the digestive tract, or of those organs that pour their secretions into it." The conditions most often responsible for this perversion of secretion are ulcer, erosions or fissure at the pylorus, acid gastritis, and hyperacid alcoholic gastritis.

Of conditions external to the stomach which sometimes are associated with hypersecretion may be mentioned diseases of the gall-bladder and appendix.

The onset of the condition at times is insidious, coming on with slight attacks of pains (called hunger pains) before food. Again, a slight uneasy sensation occurs one or two hours before meals, these phenomena often existing for months or years before the true condition is recognized. The initial attack of pain in some instances resembles biliary colic, which it sometimes proves to be. Hypersecretion often appears abruptly, coming on after some indiscretion in diet or drink, and calling the patient's attention to his disordered stomach in no uncertain terms. Nocturnal pain is also a symptom which is first noticed by some patients, and is that which causes many to consult a physician. These pains are almost invariably produced by hypersecretion, as is also nocturnal vomiting. The above symptoms should always put the physician on the look out for hypersecretion. The less obtrusive symptom of distension without much, if any pain, if not closely looked into, is likely to mislead the physician into making a wrong diagnosis, *i. e.*, flatulent or nervous dyspepsia, or amylaceous indigestion. As it is in hypersecretion caused

*A lecture delivered at the New Orleans Polyclinic.

by a diseased appendix that this symptom is most often met, the failure of alkalies to give relief should at once direct the attention of the practitioner to the appendix.

Many other symptoms are often met with in hypersecretion, but they are also common to other conditions, and for this reason I will not enumerate them.

Diagnosis.

The only way of making a positive diagnosis of hypersecretion is by examination of the fasting stomach by means of the stomach-tube, and the obtaining of more than 30 c.c. of gastric juice, usually of an acidity of from 70 to 110. If there is no retention of food the fluid is clear, straw-colored, slightly milky, or bile-tinged. If particles of food are present in the fasting stomach after a mixed meal the evening previous, the particles almost always prove to be starch granules, the meat fibres being more likely to have undergone digestion in the acid gastric juice. Before the diagnosis is complete, it will often be found necessary to wash the stomach clean the night previous to withdrawing the stomach contents the next morning, thereby enabling the physician to determine whether gastrectasis is already established.

In arriving at a conclusion as to the cause of hypersecretion, tabes dorsalis must not be overlooked.

Treatment.

Treatment is always to be directed towards the cure of the primary disease. If the underlying cause is ulcer, erosions or fissure at the pylorus, acid gastritis or hyperacid alcoholic gastritis, proper hygienic, dietetic and drug treatment proves effective in a large percentage of cases when it is early instituted and intelligently persisted in. Tobacco in excess must be discontinued. Alcohol in all forms is interdicted. Gormandizing is to be curbed, and the use of condiments and fried food prohibited. Patients who have indulged in any of the above ways, more especially if the primary disease is an acid gastritis, or ulcer, erosion, or fissure of the pylorus are benefited by hot Carlsbad or Vichy water before meals, and the administration of alkalies after eating. When the bowels are regular, I give preference to bicarbonate of soda; when constipation exists, magnesia usta is used; and, if diarrhea is a complication, precip. carbonate of lime, ammonio-magnesium phosphate or carbonate of bismuth is employed. At times a combination of alkalies will prove more satisfactory than when given separately. White of raw egg will often prove effective in controlling pain. Should the pain prove annoying, menthol gr. ¼ and spirits of chloroform 20 to 30 minims diluted with

water are to be given every four hours; or atropine in suitable doses may be given in conjunction with the alkalies after food. If the above fails to give relief, morphine can be resorted to. If flatulence becomes a troublesome symptom, spirits of turpentine gtts. x-xv., or the same amount of glycerin carbolic acid, proves helpful. To avoid many of the symptoms which are incident to chronic hypersecretion, methodical lavage should be practised. When vomiting occurs at night, or when food is found in the fasting viscus early in the morning, the stomach should be washed at least once daily. If sleep is disturbed this is best done at night before retiring. In cases of marked muscular insufficiency, it may be necessary to wash the stomach again in the morning, or during the day. For the purpose of lavage, I give preference to bicarbonate of soda, teaspoonful to quart of warm water 100° to 105° F. At times, I use a solution of argyrol (1/250) of the same temperature, allowing it to remain in the stomach five to eight minutes. In cases of dilated or dislocated stomach, I have found strapping the abdomen with rubber adhesive plaster preferable to the abdominal supporter.

Diet.

The diet should be non-stimulating, bland in character, of moderate amount, and preferably semi-liquid. While for obvious reasons it is not well to exclude amylaceous substances from the dietary, they must be allowed only in small amounts. Dextrose, or full doses of extract of malt often agree well. Cooked asparagus and cauliflower and stewed celery may be taken in moderation. Of animal foods, small quantities of veal, sweetbread, calves or sheep brains plainly cooked, also boiled or baked fish, may constitute part of the diet. Two or three teaspoonfuls of unsalted butter, and almond or olive oil may be taken at meal-time. Whole raw eggs are well tolerated; or the white portion, either alone or mixed with milk, is a valuable article of food in this condition. In case the milk disagrees, whey or Horlick's Malted Milk may be substituted for a time.

If the hypersecretion is dependent on disease of the appendix, alkalies have little or no effect in relieving symptoms; and in fact, should subacidity exist, as it often does, alkalies may cause distress. The hypersecretion in the instance of a diseased appendix usually persists until the troublesome little fellow is removed, when the condition soon abates. Should gall-bladder disease be present, suitable medication must be instituted. Upon this failing to give relief, the patient is to be placed in the charge of a competent surgeon. I have seen the condition of hypersecretion to persist when cholangeitis or cholelithiasis existed until proper surgical attention was given them. Thereupon, and thereafter, the patients were free of all symptoms of hypersecretions.

If the more serious condition, cancer of the pylorus, exists the case is always necessarily surgical. When gastrectasis is once fully established the case assumes a new phase with which it is not my purpose to deal at present.

The prognosis is to be made according to the primary disease responsible for the hypersecretion; and also according to the patient's ability and inclination to follow proper treatment.

The patient I here present to you is thirty-two years of age, and undernourished. A cigarette smoker, he uses 20 to 30 daily. He does not use alcohol, and denies syphilis. His physician advised him to consult me for a derangement of the stomach, which has persisted for eight or ten years. He complains of pain, which comes on usually about three-quarters of an hour after food, and continues for some time. Two months ago, he vomited chocolate-colored fluid (blood), which occurred on two occasions several days apart. At this time he also noticed that his stools were tarry. Pyrosis is marked at times. Nocturnal pains and vomiting occur occasionally. For some time past, his stools have been scant and hard.

Inspection shows an inclination to the habitus enteropticus. Deep pressure over the pylorus causes pain; otherwise, the abdomen appears clear. Lungs are normal. On examination of the heart, a slight accentuation of the second aortic sound is heard. Arteries are normal. On examination of fasting stomach, 500 c.c. of straw-colored fluid containing a few starch granules were obtained. This fluid had an acidity of 110. Two other examinations were made, the stomach having been washed clean the night previous. In one instance, 120 c.c. and in the other 100 c.c. of slightly milky fluid were obtained in the morning, both showing acidity of 100. The fluid obtained on the three occasions was examined for occult blood, but proved negative. Two examinations of urine showed diminution of chlorides and increase of urea. The examination of the feces was negative as to blood. Blood picture is that of secondary anemia. Capacity of stomach is 1,600 c.c. Food is never vomited.

Diagnosis.—Spastic stenosis of the pylorus, with hyperacid hypersecretion.

Treatment.

Smoking has been interdicted, and he promises to stop. Rest and quiet are advised. Methodical lavage with quart of warm water containing a teaspoonful of bicarbonate of soda was suggested before retiring, if nocturnal pain and vomiting should recur; otherwise the lavage was to be practised in the morning before breakfast. The following prescription was ordered to be taken after meals:—

Pulv. rad. rhei.....℈i.
Sodii bicarbon.....3ii.
Magnesia usta.....3iiiss.

M. et. ft. pulv.
Sig.—Half-teaspoonful in water after meals.

Atropine may be given along with the alkalies after food. For the pain, menthol and spirits of chloroform were prescribed. Should this fail to control the pain, morphine in conjunction with the alkalies is to be given. The diet advised for the present is to consist chiefly of whites of eggs, milk, cream, olive oil, and salt-free butter. If his condition continues to improve, the diet it to be made more liberal; but should food stagnation prove troublesome, a competent surgeon is to be consulted.

PERINEAL PROSTATECTOMY; ITS PRELIMINARY TREATMENT AND AFTER-CARE.

By JOHN R. CAULK, M. D., of St. Louis.

During the last decade, great advances have been made in the treatment of prostatic obstruction and remarkable results have been reported, showing a gradual improvement in the results obtained and a decided decrease in the mortality rate. The question arises, How has this satisfactory condition of affairs been produced? The answer involves several factors. First, a more careful and more refined diagnosis of the local conditions and of the existing complications. Second, the institution of appropriate preliminary treatment which tends to ameliorate these conditions and to render the patients in a much better physical condition before operation. Third, improvement in operative technique, and lastly, a vigilant post-operative care.

There is probably no operation in surgery which requires a more careful attention to detail or more accurate knowledge of when to operate than does prostatectomy. Most of the patients are old men and a great majority present some or all of the usual senile manifestations, such as cardio-vascular derangements, pulmonary complications, and various grades of renal depletion, and it is essential that these be corrected and that every possible strain be taken from these deficient organs. The improvement in diagnosis has been chiefly in recognition of complications which are in need of preliminary treatment before operation and in the more careful rectal and cystoscopic examinations. The prostate should be accurately outlined per rectum, noting its size, shape, and consistency, the condition of the seminal vesicles, the intervesicular plateau, etc., in order to determine the exact involvement, remembering always that prostatic carcinoma occurs in about 15 or 20 per cent. of such cases. Following this careful rectal examination, a thorough cystoscopic examination should be done, residual urine and bladder capacity should be accurately determined, the nature of the intravesical prostatic enlargement accurately pictured, and the condition of the bladder as to diverticula, stone, and tonicity closely observed. A total twenty-four-hour urinary output should be examined chemically and microscopically, urea and total solid determination made, and functional tests for combined renal activity done. A general physical examination, paying strict attention to the heart, lungs, and vascular system, is essential, and, if these are found deranged, they should be treated by proper therapeutic regime.

Having done this, one has a substantial foundation on which to work and can prepare his patients in a satisfactory manner for the operation.

The renal condition in patients suffering with prostatic obstruction is the most important to determine, and the one which has received far too little attention and has been the chief factor in the higher mortality in the past, after prostatectomy. The recognition of the importance of the renal condition in these cases and the adoption of proper preliminary treatment in its behalf, have done more to advance prostatectomy and to bring the operation into the domain of safety than any of the other contributory measures.

After a protracted obstruction at the vesical orifice, marked alterations take place in the urinary tract. There develops a gradual increasing residual urine with distension of the bladder, dilatation of the ureters and renal pelves, pressure atrophy of the renal cortex with its resulting hydronephrosis and, if infection supervenes, pyonephrosis or pyelonephritis, which adds to the gravity of the condition.

Frequently these conditions are overlooked, as, clinically, these patients may seem good surgical risks, presenting no clinical signs of renal disturbances, with a good twenty-four-hour output of urine of good specific gravity, urea and total solids, though they may be on the verge of renal failure. Their kidneys are secreting under tension, as a result of the back pressure, and if this is suddenly removed as by a prostatectomy, they are compelled to work under an absolutely different atmosphere and are often unable to adjust themselves to circumstances, and consequently cease secreting, the patients becoming uremic; some to recover only after stringent measures, others to meet a fatal issue in spite of all treatment.

Frequently one hears surgeons say that they are not afraid to relieve a man of a distended bladder and have seen no untoward effects resulting from it. This is perfectly true, but the conditions are not the same after a catheterization removing all the urine as they are after the removal of the obstruction. In the first case, the urinary apparel, has, in commonplace parlance, a "come-back." The alteration is temporary and the pressure soon returns to its former proportions; whereas, after the removal of the obstruction, there is no chance of any restoration of the usual pressure. It must remain relaxed and herein lies the danger.

If the obstruction has been recent, and if the residual urine is small, and if the patients have been leading a regular catheter life, even though there is complete retention, it has been found that they are not so liable to become uremic after operation. The type of case, which is the worst surgical risk, is the one which has had a long-standing obstruction associated with a high residual urine and has never been catheterized, or if so, very irregularly. This type of case is the one which is most liable to become uremic after the removal of the obstruction and is the one which should require the most careful preliminary treatment. This type

of uremia is absolutely different from the type following acute or chronic nephritis, and it is more amenable to treatment. This point has not been sufficiently recognized. I have seen quite a number of patients whom clinicians have given only a short time to live when seen in a comatose condition from a uremia of this type, and who, after a proper course of procedure, have recovered and later undergone prostatectomy and gotten perfectly well.

In determining the true renal condition in cases of this obstructive type, phenolsulphonephthalein has been a most valuable aid. In quite a large series of cases, its results have been uniform and accurate and it has been of great value in determining when the kidneys are operating in a stable manner and are capable of standing the extra strain of an operation. The test is very easily done in these cases. With the retained catheter in place, the urine is allowed to drain into the test-tube. A subcutaneous injection of the drug is given and the time of appearance noted. After this, the catheter may be corked, patient be up and about, and at the end of the first or second hour, the urine collected and the comparative reading of the hourly eliminations may be made in a short time by means of the colorimeter. For a full account of the use of the drug and of the results obtained, the reader is referred to the article by Geraghty and Rowntree, in the *Journal of Pharmacology and Experimental Therapeutics* for July, 1910.

Thus, it is our aim gradually to reduce the tension under which the kidneys of such patients are laboring and to render them accustomed to secreting under a lessened and more normal pressure and to get the bladder and ureters in a more normal state. This is best done by a course of preliminary drainage, which may be by means of the retained catheter —by repeated catheterizations or by suprapubic cystotomy.

Personally, I am in favor of a retained catheter, corked and drained every three or four hours, the bladder washed through the catheter with mild bichloride or boric solution twice a day, the catheter removed every three or four days and the urethra irrigated. I have had the opportunity of studying cases of repeated and retained catheterization and the latter seemed more preferable and much more comfortable to the patient. They may remove the cork themselves, but should be instructed not to remove it too often on account of the danger of developing a contracted bladder. In this way the tension is gradually reduced. I have seen but very few cases where a catheter was unable to pass. A coudé or bicoudé will generally go. One should never use a soft-rubber catheter in these cases, as it generally butts against the obstruction, causing trauma and hemorrhage, and often invites the ordinary urethral chill. If one at first is unable to pass a catheter, at times a suprapubic puncture to relieve the congestion may make it possible for the catheter to pass. I was asked recently what I would do if I had a case with retention of urine due to a prostatic obstruction associated with an impermeable stricture of the

urethra. Off-hand, I said that I had never seen the two associated and after thinking it over, from a pure mechanical standpoint, it does not seem to me possible. For it seems that long before the stricture could become impermeable, there would be a retention due to the combination of the obstruction from the prostate and from the stricture itself; on the other hand, it seems that it would be practically impossible to determine that one had a prostatic obstruction if there were an impermeable stricture of the urethra. As to suprapubic cystotomy for preliminary drainage, in some few cases where the catheter drain is not effectual after sufficient trial, a suprapubic cystotomy under cocaine may be efficient. As a primary procedure, in cases with a high residual urine, I am not entirely in favor. It has a disadvantage of causing the same sudden transformation of affairs as prostatectomy, except the shock incident to the operation. Of course, the outflow may be controlled by regulating the drainage apparatus, but then it seems to me that we are practically doing the same thing as by the catheter, except that the drainage in this case is uphill, whereas with the catheter it is dependent. Besides causing the sudden relaxation, the patients are confined to bed, cannot gain their strength as rapidly as if they were up and about, and run the risk of hypostatic pneumonia; and if perineal prostatectomy is to be done later, it markedly interferes in the irrigation in the after-treatment. With catheter drainage, they may be up and about, keep their appetite up, their bowels in good shape, and the kidneys seem to secrete better in the upright position. Also, as Cabot has shown, the presence of a catheter on the trigone stimulates renal secretion.

Whatever procedure we adopt for our preliminary drainage, we cannot emphasize too strongly the value of great abundance of water. If the patient is able to take it by mouth, at least a glass of water an hour should be given; otherwise infusions and rectum salt should be administered. Careful attention to the bowels and to the skin is extremely important. As a rule these patients should not be put on a restricted diet, but food should be given freely. They seem to do much better on the ordinary food. Urotropin or some urinary antiseptic is as a rule necessary. This preliminary routine is carried out until the kidneys are functionating in a stable manner, as is evidenced by the quantity and quality of the urine and by their functional capacity, and until the general clinical conditions seem satisfactory. This usually takes from ten days to three weeks and in some cases longer.

So much has been written about the technique of perineal prostatectomy that I will not take your time in discussing it. The advent of the tractor brought the greatest success to the operation by making it one of direct vision, instead of a blind procedure, allowing the operator to preserve structures that were formerly injured and lessening the liability of post-operative complications. Other than this, I should say that the improvement in the operative technique has not been of as great value in

the improved statistics as has the careful preliminary preparation of the patient for operation.

The question of anesthesia is a very important one in this class of patients. Ether has been the predominating anesthetic, and the results under its administration have been very satisfactory; but owing to its renal effects in some of these gravely disordered cases, nitrous oxide has been substituted to a considerable extent and with very gratifying results. The anesthetic, well given, is thorough, the patients being perfectly relaxed, and it is really quite remarkable to see some of these old men, immediately after operation, perfectly conscious before leaving the operating room, and with none of the unpleasant effects of an ether anesthesia. I have seen practically no chloroform used in these cases, and since the work of Opie on the association of chloroform poisoning and infection, showing the marked liver changes, it should make us even more guarded than before in its use, since most of these patients are subjects of infection.

One minor point in the operation which has added greatly to the comfort of these patients has been in the manner of closure of the skin incision. All my dealings have been with the inverted V incision of the Young operation, and the incision has been closed except at the apex of the V, where the tube and gauze are brought out. Frequently with such a closure, there develops a painful granulating nodule, owing to the turning back of the apex of the V by the pressure of the tube. This has been overcome by bringing the tube out of one of the arms of the V and closing the apex tightly. In this manner, the wound usually heals with a flat surface and causes no inconvenience.

The after-treatment in these cases is more or less routine, which ordinarily varies but little except to meet some of the complications which may arise from time to time. It is of paramount importance to have trained nurses and assistants constantly present to cater quickly to the desires and needs of these patients, in order that they be subjected to no unnecessary suffering or strain. Water should be given abundantly. Immediately after returning to the room, an infusion of 1,000 c.c. salt solution should be administered, and as soon as the patient is able to take water by the mouth, it should be given freely. As a rule, after gas anesthesia, there is seldom nausea and water is very soon tolerated. The patient should be turned frequently from side to side in order to prevent hypostasis and should be propped up on a back-rest as soon as possible. Usually, by the third morning, he should be encouraged to get up and begin to move about, and in this way to gradually regain his strength. The irrigation, as a rule, should run constantly for twenty-four hours while the tubes and gauze are in place. It is unwise to stop it entirely and to flush the bladder at intervals, as there is always danger of a blood-clot causing obstruction to the tube, and, with the bladder empty, the tube is far more uncomfortable. The temperature of the irrigation should run from 110° to 120° F., depending upon the amount of bleeding, the

rate of flow varying in the same manner. If there is no bleeding, and as a rule there is but little, the flow may be diminished to a very fine stream, but should never be allowed to flow drop by drop, as at such a slow rate a clot may form and cause trouble. Just before removing the gauze on the second day, the irrigation should run faster and warmer, as the removal of the gauze at times starts a little bleeding, and with the rapid warm irrigation this is soon checked and clotting is prevented. The tube is generally removed at the end of twenty-four hours and after this the patients are much more comfortable. By using two catheters fastened together, there has frequently been leakage around the tubes and often the patients have been made uncomfortable. This has been obviated in two ways. In the first place, there is now on the market a large round two-way rubber tube which fits snugly into the orifice, and leakage seldom occurs. Other types are made mostly of metal, but these are far less satisfactory. The second way that the patients have been kept from getting wet is by the use of a large round double ring air-cushion with a drainage opening in the centre, which runs through a hole in the mattress and spring of the bed. In this way, drainage is dependent and the patients do not become saturated as they frequently did by the use of the Kelly pad, with the drainage running off at the side of the bed. The drainage in this way was, as a rule, uphill, and a large puddle of water frequently collected and had to be siphoned off.

Cathartics should be given on the second night, followed by a mild saline on the third morning. Enemas are thought to be somewhat dangerous in these cases. Young reports 2 cases of embolism following enemas and since then has advised against their usage. After the bowels have moved, the diet should be made nourishing and in a few days the majority of the patients should be put on solid food. It is generally advisable to give urotropin when the patient is on solid food. After the removal of the tubes, and the drainage is through the perineal wound, it is important that the dressing should be changed frequently, at least every two or three hours, in order to keep the patient as dry as possible. Generally by the third or fourth day, there is continence amounting from one-half to one hour, and by the end of the week, one or two hours, and the patients may be kept entirely dry by changing the dressing after each perineal urination. The wound should receive careful attention, mild boric irrigations being given several times daily. All necrotic tissue should be removed and the wound kept clean. About the middle of the second week, the anterior urethra should be irrigated, as there is often a gluing together which may prevent the urine from coming through. At the end of the second week, most cases begin to pass their urine through the anterior urethra and, by the end of the third week, the majority of the patients are voiding in the right way. If the fistula is slow in healing, it is often hurried by curetting and by the application of silver nitrate. Sounds should not be passed as they only invite epi-

didymitis, and they are never indicated, since stricture is extremely rare. The only instrumentation should be a silver catheter before discharging the patient, in order to determine if the bladder completely empties itself and to find out the bladder capacity.

With the preliminary treatment, building up the patient's general condition, getting his kidneys functionating in a stable manner, promoting free secretion by abundance of water and getting them gradually accustomed to secreting in a more normal state by preliminary drainage, and following the routine above outlined after operation, post-operative uremia to any decided extent is extremely rare, and most patients seem to be but little upset by the operation.

Humboldt Building.

SOME OBSERVATIONS ON SUBCONSCIOUS PHENOMENA.

By S. Philip Goodhart, M. D., of New York,
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The most cursory glance through the annals of the various sciences reveals a most encouraging progress in the various branches of medicine. Perhaps nowhere in the domain of science have greater strides been made than in our knowledge of nervous structure and function. Interesting, indeed, is a comparison of the early conceptions of the functions of the nervous system with the results which later research in nervous anatomy, pathology, physiology and, finally, also in chemistry and psychopathology has achieved.

We may remember that the ancients were hardly acquainted with the brain or the cord; that they knew almost nothing of their structure, still less of their functions; and that only after many years of active speculation did the true functions of the nervous system and its relation to the "soul," or mental processes, begin to dawn upon the Greek scientific mind. The brain was originally conceived as physiologically and anatomically a purely glandular organ. Hippocrates was the first to maintain that the brain was the seat of mind. The profession in the days of Plato regarded the function of the brain as that of "cooling of the heart." Equally interesting was the idea of Erasistratus who believed that the inspired air, elaborated in the lungs passed into the heart, thence to the brain, in the ventricles of which it was converted into the so-called "animal spirit."

Finally Charles Bell discovered the motor and sensory tracts, and later investigators have further differentiated the various tracts and functions of the cord and basal ganglia. The work of Broca, Fritsch, Luciani, Hitzig, Munk, Ferrier, and others have finally established the theory of localization of function, the presence of various mechanisms for different functional activities.

Scientific research into the external aspect of the brain, and of gross localization of nervous architecture in relation to function, having reached a high state of perfection, the stream of scientific thought naturally turned to investigation into the nature of nerve elements, the cells and their prolongations. Science has made an attempt, and indeed a highly successful one, to penetrate into the hidden laboratory of cellular activity, but of the greatest importance is the fact that nerve structure and function are now being studied in a correlated sense. The results are revelations through the combined studies ot the histologist, the chemist, pathologist,

and the physiologist. These were finally correlated with experimental psychic phenomena, by well-recognized psychopathological methods.

The nucleus of the pathology of mental diseases lies in the fine changes within the laboratory of the body of the nerve cell, and it remains for later scientific investigation to recognize the most minute changes that doubtless go on there both in functional and in organic diseases of the nervous system. As to what the changes are that occur in so-called functional nervous diseases we must admit an ignorance almost as great now as it was many years ago, although our conception of functional diseases has undergone a marked change and it is now conceded that even in functional diseases cellular changes are present, transitory though they be. Great as has been our progress in our knowledge of the physical changes in the nervous system, still more, perhaps, have we advanced in our conceptions of the psychological processes that go on in strictly mental cases. Our knowledge of normal and morbid psychology has received marked impetus through special work by the French school.

A scientific study of the phenomena heretofore dealt with only by those interested in the occult has opened a wide field of investigation, rich in material for the trained psychologist. In that fascinating domain of abnormal mental phenomena, embracing the various forms of amnesia, as well as in the manifestations of so-called subconscious states as revealed in epileptic, hysterical, and toxic psychoses, and also in the various forms of obsessions, we have been able to recognize a train of allied phenomena of high scientific interest and having a practical application, therapeutically. Correlated with investigations into the strictly physical elements are the studies of observers of mental phenomena and so-called borderland cases of perverted mental function. Our knowledge of the activities of the normal mind has been augmented by a study of these so-called borderland cases so often met with among the highly cultured and intelligent.

It is indeed significant that these manifestations of mild mental changes occur among the most highly developed nervous organizations. This is, however, not surprising; the development of psychic life having been gradual, through successive eons of evolution. The most complex, more highly organized in the scale, man, is yet the most unstable and most easily affected by hurtful stimuli. As in development, so in decay, the process of degeneration affects first the more highly developed, the more delicately organized structure and function; hence, those of the highest mental attainments are the most easily deranged. We see this process illustrated in certain forms of brain disease, deterioration beginning with the highest and most esthetic qualities, those last in the process of evolution.

The study of subconscious life in man is of vital importance; indeed the mechanism of consciousness itself is hidden within the depths of the subconscious, and to these depths we must descend to understand certain

phenomena of the human mind. It is no longer possible for the intelligent physician to be without some knowledge of the phenomenon of the so-called subconscious self. From early times down to the present the mysteries of the so-called supernatural phenomena have played an important rôle in the world's drama. A study of the occult is now being made by trained scientific medical men. We know now that the revelations of "crystal gazing," "shell hearing," and many of the subtle manifestations of the so-called "spirit medium" are the products of subconscious mental activity. The crystal gazing and shell hearing and like phenomena result from the subject gazing into a crystal or listening to the "roaring" of the shell. In these we have illustrations of subconscious ideas rising into the plane of consciousness; the subconscious or sleeping self, or fragments of this self, in the form of past experiences, forgotten incidents, rise to the foreground and are either visually or orally projected into the crystal or shell. In this way are supposed "messages" delivered from the "other world." The spirit medium is capable of autohypnosis; brings to the upper consciousness knowledge of incidents and experiences hidden within the depths of her own subconsciousness. The sleeping self, the state in which the medium is able to project herself by autohypnosis is a highly sensitive self, indeed, hypersensitive to a remarkable degree. I had occasion to observe the intensity of this hyperacuity of sense in a case of dual personality. The operations of the subliminal self explain the greater part of what has been looked upon as in the realms of the mysterious; some of the greatest minds, past and present, have been impressed by the strange manifestations observed in theosophy, spiritualism, occultism and allied cults. To the critical mind it is evident that behind the various devices of deception there remain many manifestations to substantiate the belief that there must be some rational explanation for these phenomena, and we need go no further than to study the operation of subconscious states.

There are many ways of proving the co-existence of one or more selves in many individuals, perhaps in all of us. Within the subliminal self we will find buried memories, lost experiences, knowledge totally differentiated from the waking self at times reacting upon the upper consciousness, affecting the temperament of the waking self, the active personality. The contents of this hidden self may rise and become a part of the waking self; it may emerge in a fragmentary way or, if in its entirety, it may give rise to an entirely new personality, the upper self falling in turn into the realms of the subliminal. These are the cases of true double or multiple personality.

In hypnosis the subliminal self rises to the surface of consciousness, becoming for the time being the dominating personality. Double personality is remarkably well demonstrated, particularly in so-called hysterical individuals by the phenomenon of "planchette writing." By means of the planchette it may be demonstrated that while the hand of the subject is

writing impressions the attention of the upper self is operative in another direction, totally oblivious to what the induced anesthetic hand is writing. The experiments may be made so complex as to demonstrate the possibility of two independent instruments of conscious activity co-existent.

Of course, the most absolutely demonstrative evidence of subconscious activity is to be found by a study of the cases of double or multiple personality. Stevenson's "Strange Case of Dr. Jeykll and Mr. Hyde," and Julian Hawthorne's interesting tale, "Archibald Malmaison," undoubtedly originated in genuine cases; the author, of course, giving dramatic color to the tale.

The case of the Rev. T. C. Hanna,* under the observation of the writer, is the most remarkable one in medical annals. It was studied by me conjointly with Prof. Boris Sidis of Harvard University.

Hanna, in his so-called second self was able to locate hidden objects and show other manifestations of sense hyperacuity totally impossible in his normal or primary state. The case referred to was in many ways a most remarkable one of total amnesia with double personality in which the loss of memory between the two selves was entirely bridged over. The case is unique in medical literature.

I was called to Plantsville, Conn., to see Hanna six weeks after an accident which occurred while he was driving. The young clergyman was thrown upon his head from his carriage and rendered unconscious. After several hours he regained consciousness, opened his eyes on what to him was a new world. He had lost every vestige of memory, involving all knowledge of himself, all forms of language, personal relationship, his identity; even the most primitive percepts and concepts were lost. He could not differentiate between the animate and the inanimate. He did not know how to eat; he could not interpret the sensation of hunger. The world to him was a chaos of varied and uninterpreted sensations. The simplest functions had to be explained to him. However, he learned with most astounding rapidity. His reading and writing were those of a child. First he learned to print, and was ambidextrous. In his normal, or what we have termed his "primary" state, he was a fine Latin, Hebrew, Greek and English scholar. In his "secondary" his memory for newly acquired material was most acute. He learned to play instruments with marvelous ease. In his normal or primary state he was not at all musical. Thus I found the young man slowly learning anew, as though in infancy, the only difference being the marvelous retentiveness of his memory, the acuteness of his observation, and the ease with which he absorbed new ideas. We watched first his primitive states; then watched him day and night; and finally found that during certain states, especially in the early morning it was possible to reach the subconscious which contained the past experiences, the life before the accident. By psychological methods, particu-

*This case was recorded in Multiple Personality, by Sidis and Goodhart. D. Appleton & Co., 1905.

larly by what we have termed "tapping" the subconscious, we were able to bring to the surface the dormant sleeping primary personality.

During the course of treatment we had him here in New York, and were finally successful in stimulating the primary personality. In this primary state he was the Mr. Hanna inclusive of everything from his birth to the day of the accident. In the secondary state he was the Mr. Hanna inclusive of the life experiences beginning right after the accident. The two personalities alternated; in the one state he knew nothing of the other. By applied methods of psychopathology we were able to bring the two personalities together. The man finally made a complete recovery, the two lives blending into one. The case is replete with interesting psychological phenomena and is most instructive to students of mind.

The whole subject of subconscious phenomena is one which should command the interest of every practising physician. Morbid ideas, obsessions, and many forms of distressing mental conditions, not strictly within the pale of the aberrant states, find their etiological nucleus buried within the depths of the subconscious. Much of the work of Freud, Janet and others is based upon the recognized influence of subconscious phenomena.

34 W. 87th Street.

SOME LATER VIEWS ON PELLAGRA.

By Frank Eskridge, M. D., of Atlanta, Ga.

A number of interesting articles have appeared recently in the various medical publications, treating of the subject, pellagra, written from different points of view, as is natural in dealing with a disease so suddenly discovered in a new section, and one presenting so many different phases.

In this paper, it is my purpose to present the clinical features of pellagra as they appear in this country, advance the various views on etiology, as well as to give a few remarks on treatment.

My personal experience with pellagra dates back to a case observed in the Presbyterian Hospital, Atlanta, Ga., in the early spring of 1908. This case was at first improperly diagnosed as sprue by my esteemed colleague, Dr. B. E. Pierce and myself, basing our diagnosis purely upon textbook knowledge of this tropical aphtha. Later, however, upon closer examination and post-mortem findings, we decided upon the diagnosis of pellagra. Since that time I have had occasion to observe some 60 odd cases, scattered over the country, varying in degrees of intensity. The disease is far more prevalent in this country than is generally accepted, and while only about 1,000 authentic cases have been reported in these United States, the fact that the endemic territories of Europe register in the neighborhood of 300,000 pellagrins is enough to cause our careful investigation, and to recognize the importance of pellagrous symptoms in the early stages of the disease.

Pellagra is not a new disease. It can be traced as far back as 1730 when an Asturian physician described the malady under the name of *Lepra Asturiens,* and considered it a mild form of leprosy. Twenty years later we find scattered cases in one of the Northern provinces of Italy, while a number of physicians in Northern Italy and Southern Spain gave accurate accounts of a similar malady under various names, between these two dates. And it is, indeed, likely that pellagrous symptoms were recognized as unusual manifestations of other diseases, most likely leprosy, as that disease was prevalent in the named territory at that period, many years before it was recognized as a distinct morbid entity. The name pellagra, a Greek derivation meaining "rough skin," was given the disease by an Italian physician.

Pellagra is a chronic disease with periodic exacerbations of acuteness, affecting usually the rural population of countries in which Indian corn or maize may or may not constitute an important article of diet. On this continent the disease was first described by Brouchard in the early forties

in Mexico, though some reference is made in literature of the sixteenth century that a similar disease was prevalent among the Indians of North America. Twenty years later cases were reported in New York by Gray, but it is only within recent years that its presence has been detected generally. In 1883, Sherwell reported another case in New York. In 1901, Harris, of Atlanta, Ga., reported a case strongly suspicious of the malady. Five years later Alabama reported the first positive epidemic in the insane hospital of that state. The Carolinas have been contributing the greatest number of cases so far reported.

The onset of pellagra is insidious, sometimes covering a period of several years. Preceding an exacerbation of the disease there is a stage of acute invasion presenting indefinite symptoms of gastro-intestinal and nervous disturbances. Patients complain of periods of depression, becoming melancholic and dissatisfied with the usual run of affairs. They develop an abnormal irritableness, and are affected with giddiness, dizzy headaches, lumbago, and distressing insomnia. Again, these symptoms very rapidly assume a more serious character, terminating with diminished or doubled vision, uncertain gait, extreme fear, marked emotional disturbances, accompanying either a ravenous appetite, or entire loss of appetite, insatiable thirst, sensations of esophageal burnings, acid eructations and periodic vomiting. At this stage patients assume the characteristic *facies pellagrosa,* which is strikingly impressive. The peculiar cachexia and tightly drawn skin, combined with the restless rolling eye, and anxious expression immediately arouse suspicion. These symptoms, given almost in regular order of appearance, by no means appear so distinctly in every case of pellagra.

The clinical picture is not altogether typical, but the trained eye begins to detect the peculair characteristics of the disease long before the erythema confirms the diagnosis. After the appearance of the eruption almost immediately follows the diarrhea, perhaps the most aggravating symptom to be dealt with therapeutically. The eruption usually appears about three months after the beginning of the acute invasion. This is generally advanced by the actinic rays of the sun, and is commonly seen in the spring season of the year, and if left undisturbed will continue until late in the autumn. The eruption also bears characteristic features. It is symmetrical in appearance, attacks the exposed surfaces of the body, and varies in extent and severity from a small area of redness, with itching and puffiness of the skin of the backs of the hands without exposure of raw surfaces, to extensive areas of hard, thick exfoliated surfaces, sometimes cracking deeply to almost the bone, suppurating and terminating in gangrene. While the unprotected surfaces of the body exhibit commonly skin manifestations of greatest intensity, I have seen erythematous areas of the most pronounced type attacking the covered surfaces of the chest and feet. Sharply defined thickening and roughness over the finger joints is a very commonly observed condition. The epidermic

lesions of the forehead, forearms, dorsal and plantar surfaces of the feet sometimes present in advanced cases blisters, or blebs which contain a watery serum. These cases are spoken of as moist pellagra. In time these blebs burst, dry and desquamate. In cases with milder skin manifestations, I have witnessed the appearance of the dermatitis prominently for several days, which would clear without treatment, leaving only pigmented areas. In pellagrins with tendencies to obesity, the skin folds of the neck and chin form a common field of roughness and inflammation.

In children the cutaneous symptoms are much milder, of shorter duration, but of more frequent recurrence.

Of all the distressing conditions present in a case of pellagra, with the exception, perhaps, of the mental deviations, the alimentary mucous membrane involvements are the most likely to plunge the patient into deepest despondency, and the physician into utter hopelessness.

Among the disturbances of the digestive tract most frequently noted in the early stages, preceding the diarrhea, are the various forms of indigestion; some patients find that certain foods (not especially corn products) upset them. They may complain of gastric soreness and distention; sometimes nausea and vomiting are the source of much annoyance. The derangement, however, of chief importance is diarrhea. This condition may appear early or late in the disease; be temporary in duration, exist only for a few weeks, or persist throughout the entire acute stage, while looseness of the bowels is occasionally observed among patients who have suffered from pellagra for several seasons. The character and extent of the diarrhea vary within wide limits. There may be but a few movements, and these restricted to the morning hours, or there may be as many as thirty watery, frothy and foul-odored evacuations during the day. While the discharges are usually as above described, they are frequently seen to be of soupy consistency, containing blood and shreds of mucus. Patients exhibiting a virulent form of the malady present intestinal disturbances of greater severity, and are frequently disturbed at night by a desire to evacuate. Intestinal flatulence, colicky griping pain and rectitis sometimes greatly aggravate the excruciating suffering, and form most troublesome complications.

The development of stomatitis presents interesting characteristics. The tongue assumes a beefy appearance, with extremely sore tips and edges. The mucous membrane of the mouth, and the lips present marked inflammation and sensitiveness, with subsequent desquamation. Salivation increases and progresses sometimes to the production of great quantities of thick, frothy saliva, accompanied by an insatiable thirst.

In female cases, extensive vaginitis is a common symptom.

The mental and nervous disturbances of pellagrins are all important factors throughout the attack. From the invasion of the malady, expressed in the slight form of depression and mild mental confusion to

the development of real characteristic psychoses, the involvement varies. Sometimes the nervous and mental alterations are the most prominent symptoms from the onset, becoming immediately chronic, terminating fatally. In several cases I have witnessed the mildest forms of nervous symptoms with the presence of violent pellagrous symptoms otherwise. As a rule, however, the psychical and physical disturbances go hand in hand. Melancholia, extreme fear, confusion of thought and memory, depression and morbid impulses constitute the common symptoms. Maniacal excitement, delusional insanity, suicidal mania, and persecutory hallucinations are seen in the latter stages. Pellagrins have never the lucidity of the non-delusional melancholic, lacking his errors and the coherence of the melancholic delusions. They show, if exalted, more fear than rage, more confusion than gaity (Tanzi). Marked loss of muscular coördination of upper extremities is often noted, while spastic and paralytic conditions involve the lower extremities.

Tetanic convulsions were present in one of my cases, while wandering mind and body drawn by spasms closed the scene for several others. There is often great fear of impending death, and in three of my patients marked fear of being operated upon was present. The mental symptoms usually abate with the primary attack of the disease to reappear with marked character of severity and permanency later.

The temperature ranges about normal, seldom going above 102 degrees Farenheit. The pulse rate averages 110.

Pellagra is not contagious, and hereditary transmission is extremely doubtful. The causative factor of the disease has not been positively determined. The maize theory holds greater force, perhaps on account of the priority of its advancement, and the lack of scientific refutation. Sambon, in his highly interesting report of his investigations of the subject, shows a number of cases in both children and adults who had never eaten corn products. Lombroso made extensive studies in the early sixties, and arrived at the conclusion that unripe, too early harvested corn was responsible for the disease. His opinion, he claimed, was based upon the findings of two extractive toxins in fermented maize, and he claimed to be able to produce pellagrous symptoms by human injection of these active principles. This theory, in its original and modified forms, has been adhered to by distinguished scientists and medical men for years. However, the view has not been accepted by other men equally as distinguished. Belmondo has long held to the view that the disease was due to a specific organism.

Other eminent authorities on tropical diseases, including Manson, doubt the etiological responsibility of corn. Louis W. Sambon, M. D., F. Z. S., of the London School of Tropical Medicine, has advanced an irrefutable theory that not only is maize not responsible for pellagra, but it has nothing in common to do with the disease. He contends parasitic origin, advancing that the seasonal recurrences can only be explained

by the alternating periods of activity and latency of a parasite. He has shown a constant and characteristic distribution. He has also demonstrated that in certain endemic territories it affects all ages and color. A most interesting feature of his investigations is the establishment of the fact that the pellagrous territories are to a great extent confined to the near vicinities of certain bodies of running water. A species of the stinging sand-fly, *Simulium reptans,* is held by this same investigator to be responsible for the transmission of pellagra. Upon the basis of this theory, Prof. Alessandrini, of Rome, has made investigations in connection with water and pellagra. He contends that in superficial wells and unprotected water he has found larvæ of nematoda, belonging to the family of filaria, producing the disease.

Long, of the United States Hospital and Marine Service, advances a theory that "pellagra is a disease resulting from an injury to the intestinal mucous membrane, produced by amebæ." Sodium chloride is thought by some to play an important rôle in the cause. In Italy, where salt is a government monopoly, the peasantry, among whom pellagra is indeed very prevalent, make their polenta and corn-pone without addition of salt, and it has been reported that this addition will not only prevent the disease, but will overcome it to a certain extent.

In the February Health Report of the United States Marine Hospital Service, Lavinder reviews at some length the experimental work of Raubitschek, as to the effects of exposure to sunlight upon maize-fed animals as a possible factor in the etiology of pellagrous dermatitis.

In most every country in which pellagra has made its appearance, there are movements on foot to solve the problem of the causation of pellagra, but up to the present day progress has been anything but encouraging.

In the treatment of pellagra, equally as little progress has been made as in the discovery of the etiological factor. No agent has been found that exerts a specific action upon the disease. In beginning cases the removal of predisposing conditions is a most important matter of treatment. In pronounced cases, as a rule, treatment is reduced to the mere relief of symptoms. Arsenic stands pre-eminent as the one agent to combat skin manifestations; in my hands it has proved its efficiency. Dyer regards quinine of great value, while iron and strychnine have held the fort as tonic prescriptions. In my practice I employ for the pellagrous diarrhea a prescription of argyrol in a proportion of five grains to a teaspoonful of an 8 per cent. bismuth suspension, given every four hours. Atropine hypodermically in 1/300 gr. doses gives good service in combating the increased salivation. Absolute rest in bed is essential. An ointment of ichthyol and lanolin for the dermatitis is usually all that is required for this condition. Among the arsenical preparations the most useful in my hands has been the salicylarsinate of mercury, given intramuscularly. The injection is painless, and the elimination, mainly by

urine, is very marked, greatly reducing the toxicity of the drug. In my mind this preparation exerts an elective effect on pellagra. Ehrlich's dioxydiamidoarsenobenzol has been employed in pellagra to some advantage.

Torrence, McLester and Nice, of Birmingham, notice a material change in the skin lesions, ptyalism, vaginitis, weight and mental symptoms. A solution of argyrol 10 per cent., I employ routinely for the stomatitis.

Conclusions.—After an exhaustive reading of many works pertaining to the subject, and from a close study of the cases under my care, I am forced to the conclusion that pellagra is not essentially a corn disease and that it may be found under conditions that absolutely eliminate corn from the possible causes. The essential factor is still unknown, while the new theories advanced as to the etiology of pellagra should be followed with keen attention; still none of them has been proved to be more than an interesting suggestion, while at the same time the old theories occupy this same position. The disease in this country is of an acute character, assuming a severe form, but if taken in hand early the prognosis is brighter than has been pictured.

Atlanta National Bank Building.

MEDICAL AND SURGICAL PROGRESS.

INFLUENZAL MENINGITIS.

A REVIEW OF RECENT LITERATURE.

By Alfred Friedlander, M. D., of the Editorial Staff.

1. Ager: Influenzas of Childhood. (*Amer. Journ. of Obstetr. and of Diseases of Women and Children,* January, 1911.)
2. Clemens: Influenzal Meningitis. (*Archives of Pediatrics,* March, 1911.)
3. Davis: Influenzal Meningitis. (*Amer. Journ. of Diseases of Children,* April, 1911.)
4. Dunn: Cerebrospinal Meningitis. (*Amer. Journ. of Diseases of Children,* February, 1911.)
5. Holt: Acute Meningitis. (*Amer. Journ. of Diseases of Children,* January, 1911.)
6. Simon: Influenzal Meningitis. (*Monatschr. fuer Kinderheilk.,* Vol. IX., No. 10, 1911.)
7. Wollstein: Influenzal Meningitis and its Experimental Production. With full bibliography. (*Amer. Journ. of Diseases of Children,* January, 1911.)

In 1892 Pfuhl reported cases of purulent leptomeningitis due to B. influenzæ, but in these cases the influenza bacillus was not obtained in pure culture. In 1898 Fraenkel reported 2 cases, in boys of ten weeks and nine months of age. In 1899 Slawyk reported the case of a boy, nine months of age, from whom during life the influenza bacillus was grown in pure culture from the cerebrospinal fluid, and from the blood of the finger; while at autopsy the bacillus was found in pure culture elsewhere in the body. This was the first case to place cases of general influenza-bacillus infection on a sound bacteriological basis. Since this time, cases of influenzal meningitis have been reported regularly in the literature. That the condition cannot be very common is proved by the fact that Wollstein, writing in January, 1911, is able to collect only 42 cases from the literature, adding 7 more of her own. Of these 49 cases, only one occurred in an adult, and only 4 of the remainder were over three years of age. Of these 49 cases, 44 died (89 per cent.). Of the 5 recoveries, one occurred in the adult, 2 in children of seven and nine years. Practically similar findings are represented by Simon. According to his figures the mortality of influenzal meningitis averages 90 per cent. In the first two years of life the mortality runs to 94 per cent., in the first year of life to 96.3 per cent.

Holt says that the disease "almost invariably" ends fatally. He calls attention to the interesting fact that Flexner reports that a considerable number of cerebrospinal fluids sent to him with the clinical diagnosis of meningitis, contained only the influenza organism.

Davis alludes to the difficulty of settling just how many cases should be included as primary influenzal meningitis, because mixed infections occur in a considerable number. According to Davis, however, it is undoubtedly true that in many, if not in all, of the cases of mixed infection, the influenza bacillus is the primary invader of the cranial cavity, for the reason that cocci, which are found associated with influenza bacilli, are very common secondary invaders, whereas influenza bacilli are rarely found as such.

The cases are widely distributed, occurring in various European countries and in America. (Davis reports 7 cases found in Chicago in one year. Wollstein, 8 in New York in a little over a year.) It is not probable that there is any great increase in the number of cases; it is only that with newer bacteriological methods, the recognition of this special type of meningitis has become easier.

Davis, from his study of the literature, finds that the cases may be said to be sporadic, there being no tendency for them to occur in epidemics; neither is there any clear association between their occurrence and epidemics of influenza. He, too, notes the fact that the disease is largely confined to infants under one year of age.

So far as the clinical picture is concerned, in the 7 cases reported in detail by Davis, the onset as a rule was indefinite and the exact time when the meningitis developed could not always be determined. Eye-symptoms were usually present, and in all cases, rigidity of the back and legs, and retraction of the head were marked. Definite convulsions occurred in 5 cases; other early symptoms were cough, with or without definite pneumonia, bowel disturbance and restlessness. Bulging of the fontanel was evident in all cases. The temperature generally was variable, ranging from normal to 105° F., or higher and subject to sudden change. In one case there was a petechial eruption before death. The pulse was irregular, usually rapid.

Lumbar puncture (made in 4 cases) showed a highly turbid fluid, always under high pressure. In the fluid there were many leucocytes, chiefly polymorphonuclears (60-80 per cent. of all the cells). Red-blood cells were not found and the fibrin was scant.

In a case recently reported by Clemens, practically the same picture was present. Clemens notes the fact (also referred to by some other authors) that the cerebrospinal flnid is especially thick, as he says "creamy massive fluid that flowed with difficulty through the cannula."

Ager, referring to the fact that in influenzal meningitis the cerebrospinal fluid is apt to be very thick, says that it is also quite possible that in some cases of meningitis in which there is a report of a "dry tap" we have an influenzal infection, and this for the reason that in the last stages, the cerebrospinal fluid becomes so thick that it fails to pass through an ordinary needle.

Analyzing a series of 142 cases of all forms of meningitis, Dunn found 4 of the 142 cases to be of the influenzal type. This type has no special characteristics of its own, the onset, symptoms and course being variable.

So far as the pathology of the disease is concerned, Davis has reported the autopsy findings in 5 of his 7 cases. In 4 an abundant, highly purulent leptomeningeal exudate was found, most marked at the base and about the frontal lobes. In these regions, marked compression of the

convolutions occurred. Over the cortex, the exudate was often patchy, usually more abundant along the blood-vessels. In one case there was an extensive hemorrhagic exudate, delicately attached to the dura. This exudate has hitherto not been reported in influenza infection, though it is common in the meningococcus forms. In no case was there hemorrhage into the brain substance. Acute hydrocephalus was found in one case.

Histologically, the exudate was very rich in cells, chiefly polynuclears. Influenza bacilli were found in the exudate always. The exudate followed the pia into the deepest sulci, but the infiltration of the cortex was never extensive. Generally, acute degeneration of the various viscera was evident. The influenza bacillus was isolated in pure culture from the meningeal exudate and cerebrospinal fluid, in all cases. The bacilli were usually present in enormous numbers. (A finding also reported by other observers. Ed.)

Morphologically and biologically the influenza bacillus isolated from these cases was in no way different from the bacillus as found in the sputum under other conditions. The bacilli in isolated post-mortems were all tested in rabbits and guinea-pigs without showing any special degree of increased virulence as compared with influenza bacillus isolated from sputum.

Wollstein's detailed report of 8 cases showed, in each instance, that the cerebrospinal fluid was cloudy and full of sediment. In the cases in which the progress of the disease could be followed, it was seen that the spinal fluid became successively more and more purulent.

The number of influenza bacilli found in the fluid was very large, and there was very slight phagocytosis.

Detailed reports as to the morphology and cultivation of the bacilli, as isolated from these cases, are given, for which the original article may be consulted.

It is of special interest to note that Wollstein made a large series of inoculations of these bacilli into animals, using mice, guinea-pigs, rabbits, and monkeys. The most important experiments, from the chemical standpoint, were those on monkeys. Wollstein succeeded in producing infection of the meninges in two species of monkeys, by injecting suspensions of influenza bacilli into the subdural space by means of lumbar puncture. The experimental disease closely simulated the clinical disease as it occurs spontaneously in human beings and like the latter, was rapidly fatal.

With reference to the mode of infection in influenzal meningitis, there is this to be said: It is a well-known fact that influenza bacilli occur in the nasopharynx of a high percentage of persons exposed to influenza. The upper respiratory tract would appear to be the most frequent portal of entrance into the body for these organisms, and to account for their frequent localization in the middle ear, bronchi and lungs. Whether the meninges are infected directly through the lymphatic connections, existing between them and the upper nasal mucosa, must for the present remain an open question. It is of course to be remembered that in the majority of cases of fatal influenzal meningitis a general blood infection probably occurs.

Davis is of the opinion from his autopsy studies that nasal infection is most probable in the majority of cases.

No method of treatment for these cases has as yet been suggested, except that repeated lumbar punctures have been advised, especially by Dunn.

PELLAGRA.

A REVIEW OF RECENT LITERATURE.

By MARTIN F. ENGMAN, M. D., of the Editorial Staff.

1. Cole: Transfusion in Pellagra. (*Journ. Amer. Med. Assoc.*, February 25th, 1911.)
2. Gurd: Histological Study of Skin Lesions in Pellagra. (*Journ. Exper. Med.*, January, 1911.)
3. Hirschfelder: Cutaneous Tests with Corn Extracts in Pellagra. (*Arch. for Inter. Med.*, November, 1911.)
4. Lavinder: Pellagra, a Précis. (Government Printing Office, 1908.)
5. Babcock and Cutting: Prevalence of Pellagra. (Government Printing Office, 1911.)
6. Zeller: Pellagra: Some Clinical and other Features of the Disease. (*Interstate Medical Journal,* October, 1910.)
7. Babcock: Amebas as the Cause of Pellagra. (*Journ. South Carolina Med. Assoc.,* November, 1910.)
8. Buhlig: Bacteriology of the Stomatitis of Pellagra. (*Quarterly Bull. North Western University Medical School,* December, 1910.)
9. Tucker: Pellagra, with the Analytical Study of Fifty-nine Non-Institutional or Sporadic Cases. (*Journ. Amer. Med. Assoc.*, January 28th, 1911.)
10. Tizzoni: "Causa Causans" of Pellagra. (*Lancet,* January 28th, 1911.)
11. Alessandrini: "Causa Causans" of Pellagra. (*Lancet,* January 28th, 1911.)
12. Marie: Pellagra. (Columbia, S. C.: State Co. Publishers, 1910.)

Prevalence of Pellagra.—One thousand cases of pellagra have been reported from thirteen States, more than half of these being in almshouses or asylums. The cases reported have been largely from the South or Gulf States, but nests of cases have been discovered in New York, Pennsylvania, Massachusetts, New Jersey, Maryland, Oklahoma, Arkansas, Kentucky, Iowa, Kansas, California, Ohio, New Mexico, Colorado and Missouri. In Illinois it is particularly prevalent. Zeller states that the causative agent is present in Illinois in widely distributed sections of the State, and just as long as the causative factor is present and *that factor remains unknown,* just so long is public health endangered. Babcock believes that pellagra has probably existed in this country since the Civil War, as Gray and Tyler reported authentic cases as far back as 1864; the mortality of the terrible Andersonville, Ga., prison can be attributed to this scourge. Blue, quoted by Babcock, makes the statement that pellagra can be found to-day in nearly all the insane asylums and almshouses in this country. This statement, as Babcock says, is far too

sweeping. The writer of this review can assert positively that there was no pellagra present in any of the asylums or almshouses about St. Louis last June, as he personally searched all of them carefully. There were some bad sunburns and cases of eczema, but no pellagra. Pellagra, as such, is a new disease to us, that is since the excellent and fearless work of men like Babcock, Zeller, Lavinder, Young and others has forced the fact upon us that pellagra is in our midst and that it has probably been with us and unrecognized for from fifty to one hundred years. It is now established that pellagra exists in almost every State and Territory in the Union, not only in institutions but sporadically, as isolated non-institutional cases are frequent. In the State of Missouri, the writer has seen several. Tucker reports an analysis of 50 sporadic cases. The epidemicity of these cases proved that in ten instances there were other cases in the immediate neighborhood; in one instance the second patient was a sister of the first. The cases as a rule were widely separated, geographically. In the State of Virginia, in 45 consecutive cases, pellagra occurred in one county only in 19 cases, 2 cases in eight instances, 3 in two instances, and 4 in one instance. Therefore, Tucker concludes that the disease is widely spread, that it did not occur in local epidemics, that it was more common in rural districts than in cities, and that while it affected chiefly the lower classes, it was occasionally seen among those of good hygienic and local surroundings. At the request of Senator Tillman, of South Carolina, Mr. W. Bayard Cutting, Jr., Vice-Consul at Milan, made a complete report of the pellagra question, which he submitted through the proper channels to the Assistant Secretary of State. It is a masterly piece of work and industry, to which we will refer later. In speaking of the prevalence of the disease in Italy, he remarks that the total number of cases would be no true index of the progress. In 1907, there was approximately one new case for every 4,072 of the population, or 24 per 100,000 inhabitants. Rural kitchens and dessicated plants, he believes, have been potent preventive measures in checking the spread of the disease.

All writers agree that pellagra is no doubt widely distributed in this country, but not to such an alarming extent as to consider an epidemic imminent. A careful survey of the journal literature will convince one of this fact. Sporadic cases spring up now and then in unexpected districts and are now pretty generally recognized, whereas a few years ago these cases would have been classified as eczema, sunburn, or dysentery. For the last two years the symptoms of pellagra are known to the profession at large; hence, to-day we have a fair insight into its prevalence.

Etiology.—The war between the Zeists, or those who believe pellagra has some direct relationship to corn, and the Anti-Zeists, who oppose this theory, still goes on. Nothing definite or convincing has been demonstrated to throw light on the cause of the disease.

Marie's little book, especially the English translation, so ably executed and brought up to date by Babcock and Lavinder, gives the most able review of the present situation. The idea of a causal relationship between corn and pellagra is almost as old as the history of the disease itself. The corn theory is placed by these writers into the following groups:—

1. The idea that corn as a food-stuff is wanting in proper nutritive value. But corn is of high nutritive value and furthermore pellagra is found among those having a well-mixed diet.

2. The idea that good sound maize contains certain toxic substances

which cause pellagra. The idea is discredited by the absence of pellagra in many places where corn has been used for long periods as food.

3. The toxico-chemical idea that corn by reason of parasitic growths (bacteria or moulds), may undergo change with the formation of one or more toxic substances of a chemical nature (exogenous poisons).

In other words in this case we might have the formation of a poison in the grain outside the human body by these parasites which when introduced into the body may cause the disease, pellagra. The parasites may be harmless to the body, but their toxine produced in or on corn is poisonous. This is the Lombrosian idea, and has attracted the majority of adherents. Babes and Manicatide think they have demonstrated in the blood of cured pellagra patients a specific antitoxic power against the poisons of spoiled corn.

4. The toxic-infective idea that from spoiled corn there is formed within the body certain toxic substances (endogenous toxines). With this view the disease becomes a form of auto-intoxication. Marie seems to favor this view. Others believe that spoiled corn may be a medium by which the colon bacilli elaborate a specific poison.

5. The idea that pellagra is the result of a specific infection, either by moulds or bacteria, derived from corn. The flora of corn has been investigated by many. Ceni declares pellagra to be due to an infection by two moulds, the Aspergillus fumigatus and the Aspergillus flavescens. His work has not been confirmed. Ceni claims that this fungus is taken in with cereals and that its spores withstand a high temperature in cooking of food. Tizzoni declares pellagra to be due to a specific bacillus which he calls the *Strepto-bacillus pellagræ*. He finds it in the blood and stools of both acute and chronic pellagrins. The organism is supposed to be derived from spoiled corn. Marie suggests that this micro-organism may be a secondary infection. Babcock and Lavinder have been unable to isolate this organism after repeated trials.

The Anti-Zeists are greatly in the minority. Two significant facts are offered against the corn theory:—

1. That corn is used where pellagra does not exist.
2. That pellagra exists where corn is not used.

In 1905 Sambon suggested that pellagra might be due to some protozoa. This theory has met with a great deal of attention, as some of the clinical and histological symptoms of pellagra suggest such a cause. The favorable effect of arsenic, atoxyl and lately salvarsan, as cited by many, upon the disease is suggestive of a possible protozoic origin. From its having a rather similar geographical distribution to malaria and other protozoic diseases it was thought probable that some insect acted as an intermediate host. Sambon in his later investigations has come to the following conclusions:—

Pellagra is not due to maize, either good or bad, because—

1. It is found in places where maize is neither cultivated nor eaten.

2. It is absent from many places where maize is the staple food of the population.

3. It has in many places either decreased or become more prevalent without any change in the food of the people.

4. Its constant and peculiar distribution does not agree with the very irregular and ever-changing distribution of spoiled maize.

5. In over a century and a half, since the maize theory was first suggested, no one has been able to prove it.

The belief that the disease has everywhere followed the introduction of corn cultivation is unfounded. Pellagra was first recognized as a specific disease in the beginning of the eighteenth century, but this does not prove that it was not prevalent long before that time.

Pellagra is a parasitic disease because:—

1. For years the person affected may present some seasonal recurrences, which can only be explained by a parasitic agent with alternating periods of activity and latency.
2. It shows a constant and characteristic topographic distribution.
3. It shows a definite seasonal incidence.
4. Its symptoms, course, duration, morbid anatomy, as well as its therapy, are similar to those of parasitic diseases.
5. Of two places, almost contiguous, one may be affected, the other not.

Pellagra is an insect-borne disease because:—

1. It is limited, like malaria, sleeping sickness, etc., to rural places and more especially to the vicinity of certain bodies of water.
2. It has a definite seasonal incidence—spring and autumn.
3. It affects, to a large extent, a certain class of people—the field laborers.
4. It is not contagious and neither food nor water can account for its peculiar epidemiology.
5. Within its endemic centers it affects all ages and frequently whole families.
6. Outside its endemic centers only adults who have visited the infection areas present the disease and frequently only one or two members in a family are affected.

Pellagra is conveyed by *Simulium reptans* because:—

1. *Simulium* is found in the torrents and swift-running streams of all pellagra districts.
2. *Simulium* has the peculiar seasonal distribution of pellagra (spring and autumn).
3. *Simulium* is found only in rural districts. It is unknown in towns and villages. It does not enter houses.
4. *Simulium* explains most admirably the peculiar limitation of the disease to field laborers.
5. *Simulium* is the only blood-sucking insect which the British field commission has found in its visits to numerous pellagrous districts in Italy.
6. *Simulium reptans*, like *Anopheles maculipennis*, has a world-wide distribution and explains the wide distribution of pellagra. It is found wherever pellagra is found.
7. *Simulium* causes epizoötics in animals in America and in Europe.
8. Professor Mesnil has found a protozoal organism in *simulium*.

Alessandrini, of Italy, lately announced that he is convinced that the cause of pellagra was to be found in a parasite infecting the potable water drunk in the fields.

Thus we see that the scientific mind has not been inactive, as far as theories go, to explain the cause of pellagra. So it has been with all diseases whose cause is now known. Some day, someone will clarify the theory-laden clouds and a better understanding of the true cause will be attained. At present, however, one can take his choice and chance it—pick out the right theory or the proper organism, but it would be wiser to wait.

Prophylaxis.—Mr. Cutting believes that the rural kitchens established in Italy, where the food for the poor is of proper quality and prepared in a hygienic manner, have had a salutary effect. The dessicated foods also that were introduced in that country are a step in the right direction.

The Italian government has enforced certain laws for the prevention of pellagra, most of which apply to the exclusion of improper or spoiled grain and the proper care of grain. The poor are provided, as above stated, with a liberal-mixed or curative diet, the ingredients of which are prepared under the supervision of inspectors. There seems to be no doubt that proper food and proper hygienic surroundings are very necessary steps in fighting the progress of the disease. It is evident in every section that the disease is far more prevalent and in some instances almost limited to the poorer classes; this is especially so in Italy and Spain where pellagra is so widely distributed. In this country, in rural districts, there

do not exist the insanitary conditions so prevalent in the Latin countries, and, furthermore, our farming classes can usually obtain a generous-mixed properly-prepared diet. We have not the poverty and probably therefore not the pellagra.

Pellagra is certainly not a communicable disease.

Prognosis and Treatment.—Lavinder and Babcock state that pellagra is more severe and hopeless with us than with the Italians. The earlier the case is recognized the better the prognosis. The mental cases are most hopeless, as they generally go on to dementia. The chronic, non-mental type is the most hopeful. The disease may last for twenty-five years in extreme cases, but it usually runs a much more rapid course. Pellagra should be treated in an expectant way, much as is syphilis.

Diet, hydrotherapy, pleasant surroundings, arsenic in various forms, have all had their advocates. There is no doubt that much can be accomplished by treatment on a purely rational common-sense plan; that is all; no specifics have been found. Atoxyl, salvarsan, hexamethylenamine have been reported as showing "striking results" by their various advocates; but that is all. The tone of all such reports lacks enthusiasm and is not convincing. Transfusion from recovered pellagrins into those suffering from the active types of the disease has been reported by Cole with apparently fair (?) results.

Pellagra yet awaits a Schaudinn and an Ehrlich.

ANIMAL EXPERIMENTATION WITH "606."

By Carl Fisch, M. D., of the Editorial Staff.

1. Ehrlich and Hata: The Experimental Chemotherapy of the Spirilloses. (*Berlin. Julius Springer,* 1910.)
2. Gaucher (*Bulletin de L'Académie de Médecine,* Tome 64, No. 36).
3. Lesser: Organotropy-Spirillotropy. (*Berliner Klin. Wochenschr.,* No. 43, 1910.)
4. Michælis: Treatment with Ehrlich-Hata in Internal Medicine. (*Deutsche Med. Wochenschr.,* No. 49, 1910.)
5. Schindler: As to a 40 per cent. Dioxydiamidoarsenobenzol. (*Berliner Klin. Wochenschr.,* No. 52, 1910.)
6. Touton: The Practical and Theoretical in Regard to Arsenobenzol. (*Berliner Klin. Wochenschr.,* Nos. 49 and 51, 1910.)
7. Uhlenhuth and Mulzer: Culture of Spirochæta Pallida in the Testicle of Rabbits. (*Muench. Med. Wochenschr.,* No. 32, 1910.)

The discussions in the medical journals throughout the world in regard to Ehrlich's discovery of the substance with which he hoped to eliminate the infection caused by the spirochæta pallida—a discovery which resulted from the action of a chemical product that had engaged his attention for a number of years—are so extensive and manifold to-day that it would be impossible to review them in their totality. This discovery is "606" or dioxydiamidoarsenobenzol, and it is based on his revolutionizing work in the matter of the specific action of substances on specific bodies that are chemically determinable as to their constitution, but which is not applicable to immunity bodies. In all of Ehrlich's labors his investigations rest on his side-chain theory which is not biological, but physical and chemical. Thus he was led to investigate the effect of immunization by chemically determinable substances. His endeavor was not a direct attempt to find a substance that would act on the spirochæta pallida, but one that would act on the infections caused by other spirochætæ—named formerly spirilla. There is no doubt that the pallida is a typical spirochæta, and the naming it, treponema, or classing it with other microorganisms, is taking a wrong view of the matter.

The action of Ehrlich's substance was studied first in other infections caused by a number of other spirochætæ, trypanosomes and plasmodia malariæ. Splendid results were obtained by complete sterilization of the infected subject. These facts led to experiments on rabbits, because for the most part they are susceptible to inoculation with spirochæta pallida. The infection usually subsided voluntarily after a month or so, the period of incubation being usually from three to four weeks. The experiments had for their first object the quantity of "606" which was necessary to accomplish the sterilization of normal animals and the extent of the sterilization that should not prove fatal. The dose was found to be from 0.02 grm. to 0.04 grm., while 0.02 to 0.03 was tolerated

without harm. The injections were made intramuscularly or intravenously, and the results were the disappearance, in a very short time, of the specific keratitis, and the healing of the ulcerated lesions of the testicle.

By carefully testing the effect of gradually increasing doses in syphilis in man and monkeys, a limit was reached by which the full effect of the chemical was achieved without any ill effects to the organism. Ehrlich pronounced the result obtained a complete sterilization of the organism, that is, the death of all spirochætæ.

For the sterilization of the spirochætæ, trypanosomes and plasmodia, Ehrlich's method was effective, but the spirochætæ pallidæ were not destroyed. The first-mentioned parasites live only in the vascular structures and not in the tissue; while in human syphilis it is only in certain stages that the spirochætæ are present in the blood in large numbers; generally they are not found at all. The spirochætæ, to be more explicit, are carried by the vascular structures into the tissues of the body; they multiply in these locations, thus causing both small and large lesions. The resorption of "606" naturally takes place in these lesions, and hence kills the virus which is found in them.

Ehrlich himself was desirous of having his findings confirmed by authoritative investigators of the problems of syphilis before making the matter public. The "sterilisatio magna," which in other words meant the elimination, by means of one injection of "606," of the total quantity of the virus in the body, was the goal which he wished to attain. Too short a time has elapsed, however, since Ehrlich's discovery to conclude with any definiteness that this goal has been realized, since the literature on the subject is a combination of favorable and unfavorable reports; most of it being worthless on account of the inadequate description of the manner of the injection. It appears, nevertheless, that despite the fact of the shortness of time since the first experiments were made, a total sterilization is achieved only in definite stages of the infection. It is a matter of record that in many cases a relapse has occurred after the injection, though in these cases all the difficult details as to the preparation of "606" and the technique as to the manner of its injection were closely followed. At present these matters are not definitely settled, as there is no unanimity of opinion as to whether alkaline, neutral, and acid solutions, or emulsions, should be used. This being so it strikes the writer that it is a mistake that "606" is to-day accessible to every practitioner; for mistakes will arise and great harm will be done to patients on account of this lack of definite knowledge. But the question is not only one of how to prepare "606" and what method of injection to employ, but one which involves a matter of the greatest import—namely, the importance of a physical examination of the patient prior to the injection. On account of this neglect, serious consequences have already occurred.

The primary lesions are the best indications for the use of "606." They are the ones, which if thus treated, may realize the hope of a total sterilization. If possible, these lesions should be excised as was done before "606" was discovered, or, if that is not done, an injection of a strong bichloride solution under the lesion should be made in addition to the administration of "606." Many cases have been reported which have been free from secondaries after five or six months. The first secondaries are the next best indication for the use of "606," although the results are less certain than in the primary lesions.

Of course, it should not be forgotten that in cases which do not

reàct to mercury or which have an idiosyncrasy against it, "606" is an excellent substitute. The recurrences after the administration of "606" are frequent. The reason for this can be attributed to the fact that certain of the tissue structures which harbor the spirochætæ, when situated in a mass of dense fibrous connective-tissue, are poorly supplied with blood and lymph. These tissues cannot be reached by the injection, and similar to tuberculous, fibrous, or even calcareous, lymphatic glands, they may become active again and cause relapses under favorable conditions. This factor limits the capacity of "606" as an absolute destroyer of the virus. The fact, that in early tabes and in other tertian lesions "606" has almost always a beneficial effect, is most likely due to the great scarcity of spirochætæ in these conditions. Taken all in all, although total sterilization cannot be achieved in the majority of cases, this should not detract from the value and importance of Ehrlich's discovery.

This conclusion was reached even by Gaucher of the French Academy of Medicine, although the record of his cases shows that there were many recurrences. Theoretically, the question resolves itself into this, Should we accept Ehrlich's assertion that arsenobenzol acts by killing the virus? Lesser does not agree with Ehrlich in this matter, but insists that the virtues of the treatment are the result of the action of arsenic in increasing the functional activity of the tissues, thus allowing them to cope with greater strength against the invasion of the spirochætæ. And he adds, that perhaps the destruction of the spirochætæ is brought about by the generation of antibodies.

Uhlenhuth and Mulzer have made the testicle of the rabbit a culture medium for the spirochætæ. A small piece of syphilitic tissue containing many spirochætæ is introduced into this organ by means of a trocar with a wire in it, to the end of which the syphilitic tissue is attached. In three or four weeks the testicle began to swell to an enormous size and contained masses of a pure culture of the spirochætæ. By using the needle of a syringe which is thrust into the organ it is easy to get a little fluid that contains almost nothing but spirochætæ. In the dark background illumination they are found so close together that it is almost impossible to see them individually. The culture can be continued through many generations by transferring it from one rabbit to another.

This pure culture of spirochætæ offers an excellent means of arriving at the conclusion as to whether "606" acts by killing the spirochætæ or by stimulating the tissue. One rabbit was subjected by me to an injection of 0.02 grm. into the vein of the ear four weeks after inoculation. Shortly before the injection was made, the testicle was punctured and immense numbers of the spirochætæ were found. Blood taken from a vein of the ear gave a positive Wassermann reaction. Twelve hours after the injection the testicle was again punctured, but not a single spirochæta could be found. Only a few granular fragments, similar to what we see in chancres which have been cauterized shortly before examination, were demonstrable. The testicle then returned to normal size. The injection was made on October 9th, 1910, and on January 6th, 1911, the Wassermann reaction was negative and the rabbit was in perfect health. This case has been fully described because it corroborates Ehrlich's statement that "606" can effect "therapia sterilisans magna."

THE TREATMENT OF CONGENITAL CLUB-FOOT.

A REVIEW OF RECENT LITERATURE.

By NATHANIEL ALLISON, M. D., of the Editorial Staff.

1. Hagland: A New Club-Foot Operation. (*Zeitschr. fuer orth. Chir.*, Bd. XXIV., h. 3-4, 1909.)
2. Handeck: Treatment of Club-Foot in Infants. (*Zeitschr. fuer orth. Chir.*, Bd. XXV., 1910.)
3. Barnett: Treatment of Talipes Equinovarus by Plaster-of-Paris. (*Amer. Journ. of Surgery*, June, 1909.)
4. Bloom: Resistant or Neglected Club-Foot in Adolescence. (*New Orleans Med. and Surg. Journ.*, March, 1910.)
5. Crysospattes: Deformity of the Ankle from Congenital Malposition of the Fibula. (*Zentralb. fuer Chir.*, March 19th, 1910.)
6. Frieberg: Treatment of Club-Foot in Infancy. (*Ohio State Med. Journ.*, April, 1910.)
7. Ghillini: Orthopedic Surgery of Club-Foot. (*Zeitschr. fuer orth. Chir.*, Bd. XXVI., h. 4, 1910.)
8. Guaccero: Tenotomy in the Treatment of Club-Foot. (*Archiv. di Ortopedia*, n. 5-6, 1908.)
9. Kirchner: Etiology and Pathological Anatomy of Typical Congential Club-Foot. (*Zeitschr. fuer orth. Chir.*, Bd. XXI., 1908.)

Hagland has found that in extreme cases of uncorrected equinovarus, the child being ten or twelve years of age, it is well to fill the gap on the inner side of the foot, caused by the correction, with transplanted skin and subcutaneous tissue from the excess of tissue on the other side. Handeck reports several good results from the use of the Fincke-Oettinger method of correction of club-foot in infants. Barnett says that the failure to correct a club-foot is due to ignorance of the conditions present, or failure to employ the requisite technique, or a combination of both. It is essential to understand the mechanism of the deformity, the altered anatomical relationship, and most of all the treatment. Good results depend upon (1) a knowledge of the anatomical structures and mechanical principles of the deformity; (2) the technique of operative methods; (3) the prevention of recurrence; and (4) the restoration of function. He gives a careful plan of operative technique and advises the continuance of active treatment till all evidence of the deformity has disappeared. The plasters should include the knees, and an attempt should be made to keep the tarsus in a position of normal arch.

Bloom's case of resistant club-foot was that of a fourteen-year-old boy, with extreme deformity. He was able to secure for this youth a pair of useful feet after twenty months of treatment, which included manipulation, osteotomies, and forcible corrections. Crysospatte's case, though it is not one of congenital club-foot, is one in which the foot was held in

a position of equinus by congenital deformity in the fibula. This deformity is due to the lower end of the fibula being placed posterior to the tibia. This condition was overcome by an osteotomy and correction done on the lower one and one-half inches of the fibula. The result was good.

In an excellent article, Frieberg draws the following conclusions:—

1. The most potent factor at our command for the cure of club-foot is the influence of weight-bearing upon the foot held in an overcorrected position.

2. Since this factor is not available until the tenth or twelfth month, it is not necessary to maintain over-correction by means of plaster-of-Paris until a period shortly before this.

3. Tenotomy for the correction of equinus should on no account be made until the other elements of the deformity have been disposed of.

4. On account of the greater size of the foot, both the over-correction and the retention dressings are more satisfactorily made between the tenth and thirteenth month than is the case within the first few months of life.

5. The period elapsing until the time for forcible correction has arrived is not to be spent inactively, but is to be utilized for increasing the flexibility of the foot by manipulations, accomplishing a partial correction of the varus by means of a splint.

6. The daily removal of the splint gives opportunity both for massage of the limb and active muscular effort on the part of the child. It is believed that by this means the residual atrophy of the leg muscles is held to a minimum.

7. It is believed that the whole period of treatment under this plan is not longer than the other plan; that one anesthesia will as a rule suffice, whereas under the older plan several such administrations were frequently required.

8. Because of the greater age of the child, correction as above suggested is much less objectionable to the parents, and the plan of treatment usually commends itself to them, as it has to the author on account of being thoroughly rational.

In all of the foregoing, it has been assumed to be the position of the modern orthopedic surgeon that bloody operations other than tenotomies have no place in the treatment of club-foot at this age, and likewise that the more complicated forms of orthopedic apparatus, formerly employed as a means of final correction, are to be replaced with advantage by forcible redressive manipulation. It has not been considered advisable to discuss these aspects of the question at this time.

Ghillini calls attention to these interesting points. He has never had a relapse from the Phelps operation, and believes that all obstacles to complete correction should be removed; bones need seldom be removed, and when they are, only as much as is necessary should be cut out. The foot must be held in plaster for seven months in most cases.

Guaccero believes that the results of the Phelps operation are often poor, when this operation is done on young children, because the tendons and muscles of the foot are caught in the extensive scar which is part of the operation, and lose their function. Even though the morphological results, so far as a straight foot is concerned, are excellent, the result from the standpoint of function is poor because the anterior portion of the foot has lost its mobility. He has reached this conclusion after a study of the results of the Phelps operation in after-life. He has found

no real degeneration of tendons, but instead fatty-fibrous degeneration which gives a tendon too weak for the work required. He believes a tendon elongation, carefully done, has a great advantage over the tendon cutting, as the tendon's fibres are thus conserved, and the resulting tendon will be able to do its work.

Kirchner points out that a position of supination is normal in intra-uterine life, and that the feet of the new-born are physiologically held in supination. This is due to the development of the astragalus. The club-foot is not really a vicious position of supination, but a position of plantar flexion and adduction which is associated with late appearance of the amniotic fluid. In this respect it is similar to congenital dislocation of the hip. The rarity with which the upper extremities is affected he explains by the statement that the lower extremities are developed less perfectly than the upper, and also that unilateral cases are due to the fact that the two sides of the body are developed differently. He believes it to be a developmental error dating back to the second month of fetal life, and not a condition caused by intra-uterine iujnry or position.

GASTRIC MOTILITY: SOME PHYSIO-PATHOLOGICAL CONSIDERATIONS STUDIED BY THE X-RAY.

A REVIEW OF RECENT LITERATURE.

By E. H. Skinner, M. D., of the Editorial Staff.

1. Barclay: Gastric Radioscopy. (*Archives of Roentgen Ray,* Vol. XV., No. 5, p. 167, October, 1910.)
2. Barclay: Value of X-Rays in Diseases of Digestive System. (*Archives of Roentgen Ray,* Vol. XIII., p. 310.)
3. Cannon: The Movements of the Stomach Studied by Means of the Roentgen Ray. (*Amer. Journ. Phys.,* Vol. I., p. 387, 1898.)
4. Cannon: The Passage of Different Food-Stuffs from the Stomach and through the Small Intestine. (*Amer. Journ. Phys.,* Vol. XII., p. 259, 1904-5.)
5. Gross: Further Communications on My Duodenal Tube. (*N. Y. Med. Journ.,* Vol. 93, p. 76, July 9th, 1910.)
6. Haudek: Vienna Medical Society, Meeting February 9th, 1911. (Reported in the *Muench. Med. Wochenschr.,* No. 9, p. 491, 1911.)
7. Howell: Textbook of Physiology.
8. Jonas: Upon the Developmental State of Pyloric Stenosis and its Clinical-Radiological Diagnosis. The Significance of Antiperistalsis. (*Wiener Klin. Wochenschr.,* Jahrgang XXII., No. 44.)
9. Kaestle: Rieder, Prof. Dr. H. and Rosenthal, Dipl. Ing. Dr. Phil. Kinematographic Roentgenograms. (*Muench. Med. Wochenschr.,* Jahrgang 56, No. 6, 1909.)
10. Kaufman and Holzknecht: Peristalsis of the Antrum Pylori in Man. (*Mitteilungen a. d. Lab. f. vad. Diag. in Wien.,* Band I., Heft 8, p. 67, 1906.)
11. Leonard. (*Amer. Journ. of Med. Sciences,* March, 1909.)
12. Mitchell: Atonic Dilatation of the Stomach. (*Lancet,* January 28th, 1911.)
13. Pancoast: The Radiographic Examination of Gastro-Intestinal Tract, etc. (*Trans. Amer. Roentgen Ray Soc.,* p. 45, 1908.)
14. Pfahler: Physiologic and Clinical Observations on the Alimentary Tract by Means of the Roentgen Rays. (*Journ. Amer. Med. Assoc.,* Vol. LIX., pp. 2069-2074, December 21st, 1907.)
15. Schwarz: Vienna Medical Society, Meeting February 9th, 1911. (Reported in the *Muench. Med. Wochenschr.,* No. 9, p. 491, 1911.)

Up to the time of Cannon's studies, the physiology of the stomach motility had been deduced from inspection of the stomach in animals and man after a laparotomy, or following a permanent gastro-abdominal fistula, or watching the gastric movements upon the abdominal wall, or by

means of gas bags inserted into stomach and then inflated. Cannon used the subnitrate of bismuth in food, which permitted the movements of the stomach to be viewed by the roentgen ray, fluoroscopically.

A modern physiologist, Landois, describes the motor mechanism of the stomach as consisting of middle circular, external longitudinal and internal oblique muscular fibres, with a circular sphincter at the pylorus and the cardia. There are two distinct movements: (1) The rotary, rubbing movement, by means of which the walls of the stomach lying in immediate contact with the ingesta move to and fro with a slow, displacing movement, which movements succeed one another periodically, each cycle occupying several minutes; (2) a peristalsis of periodic recurrence in conjunction with rhythmic opening and closing of the pylorus, as a result of which the partly dissolved gastric contents are little by little propelled into the duodenum, commencing after an interval of about five minutes and ending at about the fifteenth hour. Each peristaltic wave lasts about twenty seconds, with an interval of from fifteen to twenty seconds. The peristalsis is most active from the pyloric antrum to the pylorus; and the longitudinal fibres passing toward the pylorus, in contracting, cause dilatation of the pylorus, especially when the pyloric antrum is full.

These preceding physiological ideas are dependant to a certain extent upon the work of Cannon (Landois gives Cannon credit), who summarizes his studies, in part, as follows: The stomach consists of two physiologically distinct parts, *i. e.,* the pyloric part and the fundus. The fundus is an active reservoir for the food; while over the pyloric part, when food is present, constrictive waves are constantly carrying the food towards the pylorus, through which the contents are gradually squeezed. The stomach is emptied by the formation, between the fundus and antrum, of a tube along which constrictions pass. The food in the pyloric portion is first pushed forward by the running wave, and then by pressure of the stomach wall is returned through the ring by constriction, thus mixing the food thoroughly with the gastric juice in the pyloric part of the stomach. The food in the fundus is not moved by peristalsis and is, therefore, not mixed with the gastric juice, permitting salivary digestion until stopped by the acid gastric juice. The pylorus does not open at every approach of peristalsis, but only at irregular intervals. The arrival of a hard morsel of food causes the sphincter to open less frequently, thus materially interfering with the passage of already liquefied food. The constriction waves have therefore three functions: the mixing, trituration, and expulsion of the food. Cannon states that at the beginning of vomiting, the gastric cavity is separated into two parts by a constriction at the entrance to the autrum: the cardiac portion is relaxed and the spasmodic contractions of the abdominal muscles force the food through the open cardia into the esophagus.

Pfahler contends that abdominal contractions serve to stimulate peristaltic movements and mix the food in the stomach, as he has given an ounce of bismuth to a patient after an ordinary meal and noted the bismuth to be thoroughly mixed with the food in a minute or two. The abdominal contractions assist in emptying the stomach by raising it so that it serves as a reservoir, thus relieving obstruction caused by a kink in the duodenum, and by stimulating peristalsis.

Gross discusses the motor mechanism as due to the harmonious action of three phases of motility: (1) The first phase occurs in the fundus, consisting of rapidly succeeding, flat, undulating motions of slightly progressing character, with slight oscillations of contraction around the

gastric contents, which maintain a certain tonus of the stomach walls. The contractions deepen only when they reach the lowest point of the greater curvature, and they gradually increase in depth toward the pylorus. There is a corresponding similar contraction visible upon the lesser curvature. Gross describes a sphincter antri pyloric, resulting from the exhibition of the contraction of the lesser and greater curvature, at a point about four finger-breadths from the pylorus. Holzknecht describes a concentric peristalsis of this pyloric area. However, the studies in bioroentgenography do not substantiate this contention of Holzknecht and Gross. (2) The second phase of gastric peristalsis occurs in the antrum pylori or so-called accessory stomach. Vigorous power is exhibited here; the contractions are longer, and are tonic in character. Gross describes a leech-like shortening in the longitudinal direction, by means of which the fluidified food is pushed through the pylorus into the duodenum. (3) The third phase notes a subsidence of the powerful antral peristalsis; and the food morsels which have not been propelled forward, float back into the stomach cavity through the now relaxed so-called sphincter antripyloric. Gross even considers that there may be a slight antiperistalsis even in the normal, but it is generally conceded that antiperistalsis is a symptom of pyloric stenosis.

Before passing to the influence of pathological processes upon gastric motility, it may be well to consider the relation of the tonicity of the stomach muscles to peristalsis. There is a difference between the tonic action and the peristalsis, and Barclay aptly defines the stomach as a potential space which should contract upon its contents in such a manner that the tubular form is maintained until the stomach is empty. The tonicity, being under the control of the central nervous system, may be altered rapidly, as may be observed when one suffers a sinking feeling accompanying nausea, sudden fear and disgusting smells. This sensation is also accompanied by actual relaxation of the tonicity, and the lower border of the stomach drops, while in retching and vomiting we have an increase of tone and elevation of the stomach outlines. Loss of tone is associated with loss of appetite, while appreciation of food tends not only to stimulate the flow of gastric juice, but increases the tone. Atony is not found in gourmands. Atony of the stomach is defined as the failure of the muscles to maintain the tubular form against the forces of gravity. In the mildest degree of atony the food is held up for a short time and then gradually gravitates to the lowest part, with always some evidence of tubular formation remaining even after a prolonged period; if there is marked atony, food straightway gravitates to the lowest part and only the lower border can be outlined. Frequently at operations the stomach, which has appeared at the *x*-ray examination to be quite normal, is found as a large flaccid sac, and vice versa. This discrepancy is accounted for by the fact that nausea and disgust will cause relaxation of tonic action, *i. e.*, the stomach will become a large atonic sac, whereas in retching or vomiting it is contracted up. Anesthetics paralyze the involuntary muscle of the stomach; consequently the condition found at the operation is that in which the muscle happened to be when the anesthetic acted upon it.

Barclay finds peristalsis to be variable in quantity, easily excited, inhibited, altered in force, or by character in food, tone, and influence from uncontrollable factors. He considers an excessive peristalsis only where waves actually meet to segment the shadows near pylorus, which is regularly encountered in lesions near the pylorus or some obstruction. Peristalsis may be absent and not to be proved in some stomachs with perfect tone, or with

pyloric obstruction. In such cases, which came to be operated upon, there was extensive carcinoma, or ulceration near the pylorus, or upon the lesser nerves that pass from the pylorus through this area direct to the gastric muscle. Conversely, good peristalsis may be present in the stomach with no tone. Chronic pyloric obstruction gives rise to retention of food. If the tone is good we see broad fluid below the air, which ripples and splashes when patient is shaken.

Holzknecht considers the gastric motor phenomena, when studied by the *x*-ray fluoroscope, to present the following information: There is no active movement in the cardiac portion but there are deep contractions upon the lower portion of the greater curvature, which travel toward the pylorus, gradually becoming deeper until they reach a maximum depth at what Holzknecht calls the sphincter pyloric, a point three or four finger-breadths above the pylorus. Opposite to this deep constriction, which is energetic and persistent at the entrance to the pyloric area, there occurs a similar depression upon the lesser curvature, called the *incisura angularis*. There is no movement of the upper part of the lesser curvature visible by *x*-rays. But the depressions of the lesser and greater curvature eventually meet so that there appears upon the fluorescent screen a distinct, clear line between the shadow of the contents of the corpus and antrum. The shadow of the antrum disappears gradually, its contents being emptied into the duodenum by a process of concentric contraction. The constriction, three or four finger-breadths above the pylorus, has the effect of a sphincter which periodically cuts off the antrum from the body of the stomach. Holzknecht is undecided as to whether there is a simultaneous peristaltic movement of the circular contraction toward the pylorus or whether this circular depression remains stationary and the evacuation is brought about by a contraction of the longitudinal fibres alone. Rieder, Kaestle, and Rosenthal differ from Holzknecht in their interpretation of the movements of the pyloric region. They doubt the division of the stomach into two different parts from their bioroentgengraphic examinations, and further state that anatomists fail to show any trace of a transverse muscular band, or anything in the nature of a true sphincter at the entrance to the antrum pylori. Their tracings show that formation of the new antrum does not commence at the spot where the final emptying of its contents occurs, and is therefore not a mere relaxation of the contracted walls. If we adhere to the idea of an antrum pylori, then it is necessary to speak of two such antra existing side by side and at the same moment. We must speak of an old and a new antrum. As the old antrum disappears, a new antrum is developed from the wall of the body of the stomach. This new antrum passes pylorus-wards, and ultimately takes the place of the old antrum, while another new antrum begins to form. In their opinion there is no true antrum pylori, any more than there is a sphincter pylori, in the sense of the older observers; what they see in the regio pyloric is an increase in the energy of the gastric peristalsis and an increase in the height and depth of the wave summits and depressions.

These investigators consider the peristaltic depressions, apparent upon the greater curvature, to be of less depth than Holzknecht infers, and should be described as a valley instead of a depression, which, however, still occurs opposite to the incisura angularis of the lesser curvature. They consider that this contracting depression from the lesser curvature dips into the stomach contents and shovels them on towards the pylorus.

By the time one of these scooping contractions reaches and vanishes at the pylorus, another has started with its base at the same place as its predecessor. Knowing that the pylorus can remain shut even during the contraction of the pyloric portion of the stomach, one infers correctly that there is a reverse stream of a portion of the pyloric contents into the stomach sac. It is calculated thus: Supposing that the pyloric portion will hold about one-tenth of the stomach contents; then assuming that there is no back current, the stomach will empty itself in ten contractions, *i. e.*, in ten times twenty-two seconds, or four minutes. However, it takes several hours for the stomach to release a bismuth meal. It is therefore clear that the antrum or pyloric area returns the greater portion of its contents into the stomach sac.

Probably of greater physiological interest, and certainly of great value to the internist, are the studies of Cannon upon the passage of different food-stuffs through the stomach. In experiments upon cats, he found that gastric peristalsis was slower for fats (5.2 waves per minute) than for the carbohydrates (5.8 waves per minute). Fats remain long in the stomach and their discharge into the duodenum begins slowly and continues at nearly the same rate at which the fat leaves the small intestines by absorption and passage into the large intestine. Carbohydrates leave the stomach soon after ingestion, passing out rapidly, and at the end of two hours reach a maximum amount in the small intestine. The carbohydrates remain in the stomach only about half as long as the proteids. Proteids frequently do not leave the stomach at all during the first half hour. After two hours they accumulate in the small intestine to a degree only slightly greater than that reached by carbohydrates an hour and a half earlier. Egg albumin is exceptional in that it leaves the stomach at about the carbohydrate speed. When carbohydrates are fed first and proteids second, the presence of proteid in the cardiac end of the stomach does not materially check the departure of the carbohydrate food lying at the pylorus; but the reverse does check the outward progress of the carbohydrates. When proteids and carbohydrates are mixed, the discharge is intermediate in rapidity. Mixing fats and proteids, or fats and carbohydrates, further reduce the rate of exit of both proteids and carbohydrates. Doubling the amount of carbohydrates increases the rapidity of the carbohydrate outgo during the first two hours; doubling the proteids delays the initial discharge of proteids.

While stating that gastric peristalsis seems to sweep towards the pylorus from the middle of the greater curvature, even regardless of an artificial opening of a gastro-enterostomy, Barclay thinks that the food-stuffs pass to the pyloric antrum in the order in which they are taken or eaten unless a heavier food should succeed a lighter one. To verify this observation that food-stuffs take positions according to their specific gravity, Barclay cites a case in which bismuth food was given and shown at the bottom of the stomach. Then ordinary food was given without bismuth, which did not cast a shadow. Then bismuth and milk were given which entered the stomach rapidly and outlined the whole contents. Rapidly there succeeded definite shadows in layers of the three ingested masses. No appreciable mixing ensued, but apparently the fluid swallowed flowed around the mass to the pylorus unobstructed, leaving the bismuth taken with the milk as the third and upper layer of the contents.

Peristalsis of the stomach musculature is a normal function, but an active peristalsis does not presuppose a normal pyloric discharge of stomach contents. Further, the discharge function of the pylorus does not

depend upon the peristalsis of the stomach. On the contrary, a stenotic pylorus will produce a vigorous peristalsis in a stomach with good tonicity, or in a stomach with a compensating hypertrophic musculature. The stenotic pylorus will even produce an antiperistalsis. The latter, however, may also be produced by other changes in the pyloric area and will be discussed later in this review.

The mechanism of the functionating pylorus is interesting. What produces the opening and closing of the pylorus? Does the pyloric orifice open because the food at the pylorus contains some free or an excess amount of acid content, and then does it close because the alkaline duodenal secretion promptly neutralizes this free acid content and closes the pylorus? Does a hyperacidity indicate that the gastric ulcer or erosion is situated at the pylorus, and that the organic nature of the lesion or the spasticity, produced by the irritation of the lesion by excessive acidity, accounts for the stenosis of the pylorus, which may be either a spasmodic functional condition or an organic one? If the acidity of the stomach contents is responsible for the proper discharge of stomach contents, why give soda and alkalis to relieve gas formation in functional disturbances; rather give something to increase the acid content and promote the exit of food-stuffs.

Barclay and Cannon both assure the segmentation or layer formation of the stomach contents, thus making possible a carbohydrate digestion in the cardiac end of the stomach and the gradual aggression of the gastric acid digestion by the pyloric antrum. We are brought to the conclusion that the real gastric acid digestion occurs only in the pyloric antrum, and that the normally and gradually acquired acidity of the antral contents produces the opening of the pylorus when digestion of proteids has progressed to the point where there is a slight local hyperacidity.

The mechanism controlling the relaxation of the sphincter pylori is obscure. It does not relax with the approach of each wave, but at irregular intervals. Cannon connects it with the consistency of the food, in that solid objects forced against the pylorus prevent its relaxation and retard the exit of chyme. Liquid food alone passes rapidly. Howell considers the sphincter to be in a state of tonic closure with a certain orderliness in its relaxation, especially in the separation and ejection of the more liquid from the solid parts of the stomach contents.

The stomach receives its nervous supply from the splanchnic and vagi nerves. The vagi fibres are motor and promote contractions when stimulated. The splanchnic fibres are inhibitory and produce a dilatation when stimulated. Movements of the stomach may be stopped by anxiety, rage or distress as has been proved by Cannon.

Howell contends that the stomach is an automatic organ which is merely regulated by these extrinsic nerve fibres, as the stomach will continue movements when excised if it is kept warm. Gastric digestion may continue normal also after a secretion of these extrinsic nerve fibres. Howell says that the stomach may be considered just as automatic an organ as the heart. Leonard discusses the relation of wave form to functional activity in the stomach as determined by radiographic studies. He says that deficient functional power may be present in stomachs that conform in shape to those having perfect function. The significance of the wave form is determined in the individual case by the functional efficiency enabling the stomach to empty itself in a given time. Exclusive of new growths, ulcerations, cicatrices and ptosis, the most frequent interference in functional efficiency is noted in dilatations. Dilatation of the stomach

may be passive, owing to a muscular atony or a lack of intra-abdominal support. An active dilatation with hypertrophy of the musculature is usually caused by the organic or spasmodic stricture of the pylorus. By both *x*-ray negatives and the fluoroscope the presence of an abnormal residue of bismuth porridge may be determined, and is indicative of a lack of motor efficiency. To differentiate between the passive or asthenic dilatation, or the active or sthenic hypertrophic dilatation of the stomach, the *x*-ray should be used to study the type of peristaltic wave displayed by the stomach. The form and amplitude of the peristaltic wave shows a constant relation to the amount of work to be accomplished, the character of the food ingested, the position of the patient during the examination, and the amount of the gastric contents. This normal form and amplitude or wave varies in pathological conditions. The passive or asthenic gastrectasis provides practically no peristalsis in the erect position of the patient, and in the recumbent position there is only a slight wave form. The active or sthenic gastrectasis provides a wave of greater volume and less frequency, and is more pronounced if the patient is recumbent. In cases of gastrectasis due to obstruction we find this active peristalsis. Leonard draws attention to the therapeutic value of rest after eating for all cases of motor insufficiency, since the peristaltic waves are increased in strength in the recumbent posture.

The fact that ulcerations and erosions interfere with the normal exhibition of peristaltic waves was discussed at length in a previous review upon gastric ulcer, published in this JOURNAL in February, 1911. Rieder, Haudek, Faulhauber, Holzknecht, Jonas and others have published reports of radiographic examinations displaying such findings, which were subsequently verified by operation. Mitchell, in describing the use of the phonendoscope and percussion for studying gastric sounds and peristalsis, says that a peristaltic wave cannot pass over an eroded area. This is what we find in other parts of the body, where the muscular fibres hold rigid when overlying mucous membranes are eroded. Again, spasmodic contractions at the site of an ulcer may be excited by the highly acid nature of gastric contents.

Antiperistalsis, or peristaltic waves running from the pylorus toward the greater curvature, may generally be considered as a pathological condition. Jonas maintains that antiperistalsis does not depend upon chemical irritation, but occurs when substances within the stomach are too large to pass the pylorus; and that where there is a pyloric stenosis the stomach contents are relatively not finely divided enough to pass the narrowed lumen of the pylorus and remain in the stomach for some time before becoming finely divided enough to pass on. During this abnormal delay in subdivision or transition into chyme antiperistalsis manifests itself. Schwarz has noted antiperistalsis where there was a narrowed lumen of the pylorus due to cicatricial contractions or infiltrations near the pylorus from ulceration and in cases of duodenal stenosis. Haudek considers that *antiperistalsis occurs always from organic changes in the walls of the stomach at or near the pylorus.* He cites 5 cases with antiperistalsis without symptoms of pyloric stenosis, but in which ulcers were present near the pylorus, and some 40 cases manifesting antiperistalsis, fluoroscopically, one-half of which came to operation. Of the latter, several showed ulcer upon the lesser curvature with normal pylorus; one presented an infiltrating carcinoma free from the pylorus; one had a duodenal stenosis with adhesions to the posterior wall of the stomach, and in the remainder the antiperistalsis was due to pyloric stenosis.

It is to be remembered that the facts brought out in the above review have been determined by the use of the *x*-ray, either fluoroscopically, or by the use of photographic plates. The study of wave forms and peristalsis is naturally studied best by the use of a large fluoroscopic screen by means of which the moving parts may be seen in action. Deducing wave form from negatives is hazardous, and will lead to wrong conclusions all to frequently. Constant attention to methods of protection to both operator and patient is enjoined. An appreciation of the advantages of ocular accommodation to fluoroscopic shadows in a totally dark room is necessary to successful diagnosis.

Mayo (Wm. J.) aptly says that the stomach has been credited with a host of diseases which it never possessed, and has received an amount of treatment for supposititious conditions which is of little credit to the medical profession. In this respect the stomach resembles the urinary bladder, the supposed diseases of which have been so greatly reduced since the cystoscope, ureteral catheter, *x*-ray and other means of direct inspection have come into general use. Mayo thinks we have paid relatively too much attention in the past to the chemistry of the digestive process and too little to the more important function of motility. Mayo epigrammatically says: "Mistakes in diagnosis are more often the result of a lack of examination than a lack of knowledge."

It remains for the profession to familiarize themselves with the possibilities of the *x*-ray in gastro-intestinal diagnosis. The study of the motility afforded by the fluoroscope, with proper apparatus, cannot but impress the internist and surgeon with the additional diagnostic facts thus determined.

PRACTICAL MEMORANDA.

ADHESIVE PLASTER IN WOUND DRESSING.

By John Young Brown, M. D., of St. Louis.

In applying adhesive plaster to retain dressings following a surgical operation, the surgeon is frequently annoyed by the failure of the plaster to stick to the skin. This difficulty can readily be overcome by spraying with ether the surface to which the plaster is to be applied. The ether causes the skin to dry quickly and the adhesive plaster quickly takes hold. Cotton should always be placed on the gauze. By so doing, the plaster not in contact with the skin can be readily turned back by cutting in the centre. The dressing can be changed, and by the use of tape the adhesive bandage is again adjusted, thus avoiding the annoyance and pain or removing the plaster at each dressing.

TO PALPATE NORMAL OR SLIGHTLY ENLARGED SPLEENS.

By Creighton Wellman, M. D., of Oakland, Cal.

In working with nervous or fleshy individuals, by having the patient sit or stand with the chest and shoulders loosely hanging forward (as is naturally done by many who stand and sit incorrectly), the physician also standing or sitting, facing the patient and to his left, can insert the fingers of the left hand far under the ribs and determine the character of the spleen in a manner otherwise impossible.

DIAGNOSIS OF TUBERCULOSIS OF THE INTESTINE.

By. F. M. Pottenger, M. D., of Monrovia, Cal.

For many years physicians have considered the presence of tubercle bacilli in the feces as being absolute evidence of tuberculosis of the intestines.

Recent experiences, however, show that this cannot be relied upon. In the Pottenger Sanatorium we have made over 600 examinations of the feces of tuberculous patients and have found tubercle bacilli present in about two-thirds of the advanced cases.

These bacilli find their way into the feces through swallowed sputum. In order to reduce this source of bacilli to a minimum, samples are taken with the following precautions.

When the patients arrive in the institution we instruct them thoroughly as to the danger and undesirability of swallowing sputum, and impress

Footnote: A department for the presentation of new or but little known points in diagnosis and differential diagnosis; therapeutic observations; special formulæ; medical, surgical and laboratory technique; and new instruments and appliances. These "Memoranda" are contributed to the Interstate Medical Journal by the authors to whom they are credited.

upon them extreme care. Then we wait one week so that the alimentary canal will be well cleaned out before taking the sample. But even with this precaution, patients constantly swallow bacilli. Therefore, finding bacilli in the stools means nothing so far as diagnosis of tuberculosis of the bowel is concerned.

The seat of tuberculosis of the bowel is usually at the lower end of the small intestine—the appendix, cecum, or ascending colon. The symptom of rigidity of the muscles in case of appendicitis is well known. I have found that those portions of the intestine, which are most apt to be involved in tuberculosis of the bowel, reflect also in the superficial muscles on the right side; consequently, if the examiner will palpate very lightly but carefully over the abdomen, he will find when tuberculosis of this portion of the bowel is present that the rigidity of the muscles on the right side is greater than normal. I have used this sign now for several months and find it very valuable.

THE BACTERIOLOGICAL DIAGNOSIS OF EXUDATES, ETC.

By Edward C. Rosenow, M. D., of Chicago.

The inoculation or vaccine treatment of infections makes accurate bacteriological diagnosis imperative. The differentiation of streptococci and pneumococci, while quite accurately worked out in bacteriological laboratories, is still too often attempted by clinicians and in "clinical laboratories" on the older points of difference, viz.: chain formation, morphology and growth on ordinary culture media. These are often wholly inaccurate and frequently lead to disastrous results. The many mistakes in the identification of the cause of infectious processes, which have come to my notice during the past eight years, prompt me to emphasize some simple yet essential points in technique in the bacteriological diagnosis of exudates, etc. Make at least a Gram stain, counterstained with weak carbofuchsin of the material at hand. This serves as a guide to the kind of organisms present and their number. If diplococci resembling pneumococci are found a capsule stain may be made. Of the methods in vogue for staining capsules, the one reported by the writer in the *Journal of the American Medical Association*, February 11th, 1911, has the widest range of usefulness. But even this method is not reliable enough in some instances to differentiate clearly between pneumococcus, streptococcus mucosus and streptococcus pyogenes.

If the pus or other material has been contaminated as is always the case when the discharge has continued for some time, wash it in several changes of broth or distilled water and plate out directly into blood agar plates. Blood agar is prepared by adding approximately 0.5 c.c. of sterile defibrinated blood (human or animal) to each tube of 5 c.c. of melted plain agar after it has cooled to 40° C. The defibrinated blood for this purpose may be kept on ice for a month or longer provided hemolysis has not taken place; samples differ in this respect. The value of blood agar plates and blood containing media is very great because they make a most favorable culture medium for highly parasitic organisms, such as bacillus influenzæ, pneumococci, meningococci and gonococci, and which nearly always fail to grow on the ordinary culture media. Its value is far greater than serum agar because the blood serves among other things to differentiate quite clearly between streptococcus pyogenes and pneumococci. The former produces a zone of hemolysis, manifested

by a perfectly clear area which begins immediately around the colony, while the pneumococcus (and streptococcus viridans) produces a zone of green and very occasionally a narrow clear area of hemolysis peripheral to this. These points of difference have never failed in my hands. In the examination of hundreds of stains, I have never seen pneumococcus colonies produce hemolysis which begins immediately around the colony, while pathogenic streptococcus pyogenes always produced more or less hemolysis which begins immediately around the colony itself.

Differentiation of green-producing colonies of diplococci may be made by use of inulin. This is not often necessary because streptococcus viridans produces lesions relatively rarely.

In this connection should be emphasized the great value in thorough centrifugation of fluids in which the bacteria may be relatively few, such as cerebrospinal fluid, pleural, or peritoneal. The smears and cultures should be made from the sediment and as early as possible after they are withdrawn.

HOW TO MAKE CARDIO-DILATORS.

By Jesse S. Myer, M. D., of St. Louis.

In a paper read before the American Gastro-Enterological Association and published in the *Journal of the American Medical Association*, October, 1910, the writer described a simple method of dilating cardiospasm. Since the publication of this article many inquiries have been made as to where the cardio-dilators could be obtained. In each case I have had to explain that the dilator is made upon the same principle as those used by Russell, Strauss, Plummer, and others, but that the ones used by me are prepared in my office. I take this opportunity, therefore, of describing their preparation a little more minutely, with the hope that others who have occasion to use this appliance may find the same satisfaction in their preparation that I have. Instead of using the ordinary sized stomach-tube, I have employed the nasal tube, size 22 F. to 24 F., without any opening in the end, and make two openings in the side at the points desired. A tube of this calibre can be much more readily introduced through the stricture than the tube of ordinary size. The dilating bag consists of two layers of rubber, one inside and one ontside of a china silk bag which can be made any size that is desired. For general use I have found a bag about 3 cm. in diameter applicable in most cases. The rubber used in the preparation of these bags is commonly known as Penrose drainage tubing and can be obtained in yard lengths and in different diameters. Sizes 4 and 6 respectively are used for the inner and outer bags, and the silk bag of a sausage shape is inserted between. These are fastened to the end of the stomach or nasal tube by tightly winding the ends with silk thread attaching one bag at a time. In order to make this tube more rigid for the introduction, a mandarin made from the ordinary dental engine cable is employed. After the bag has been inserted to the proper point, the mandarin is withdrawn and a large glass syringe, such as is used for bladder irrigations, is attached filled with water. With this gradual dilatation is made until the desired pressure has been exerted.

CORRESPONDENCE

PARIS LETTER.

ACUTE ANTERIOR POLIOMYELITIS AND ANIMAL EXPERIMENTATION.

By Auguste A. Housquains, M. D.

The question of the contagiousness of infantile paralysis is at present occupying the minds of physicians more than any other question. And this interest in the question is not purely theoretical; it also has its practical side, and this is of the greatest importance since this disease may at any time become epidemic. This, at least, is the thought which seems to prevail, though at present there is no unanimity of opinion among physicians, for the authenticity of epidemics of infantile paralysis has been questioned by certain authorities.

The proofs which we have of the infectious nature of acute anterior poliomyelitis are incontestible. In 1888 Cordier was the first one in France to publish an account of a veritable epidemic of infantile paralysis. According to him, in a village of 1,500 inhabitants he observed, in the course of three months, 13 cases of the affection known and described under the name of infantile paralysis on account of the alteration in the anterior horns of the spinal cord. The author noted the intensity of the fever, the concomitance of the convulsive phenomena, and was struck with the fact that the upper limbs were affected in many cases and that the medulla oblongata and the lower end of the fourth ventricle were not always free from changes. Cordier concluded that the atrophic paralysis was in reality an acute infectious disease depending on a general infection which localizes itself by preference in a circumscribed region. Médin studied the epidemic, which occurred at Stockholm in 1887, with great precision. It is necessary here to remember that it was Bergenholz and Oxholm who described the first epidemics of infantile paralysis.

With the knowledge gleaned from the thorough work of Cordier and Médin, M. Pierre Marie elaborated the conception of the infectious nature of infantile paralysis. Nothing is more striking, in fact, than the febrile onset and the general phenomena which mark the beginning of the affection, than the perivascular inflammatory lesions which explain the mode of penetration of the virus into the anterior horns of the cord. Moreover, adds M. Marie, do we not know that infantile paralysis may result after divers infectious diseases, such as measles, typhoid fever, etc.? These allied facts, in regard to the existence of epidemics that are clearly outlined, can only corroborate the infectious theory of acute anterior poliomyelitis.

But the question of the infectious nature of the disease is less simple than it at first appears to be if we limit ourselves exclusively to the above facts. Physicians have pointed out for some years that a certain number of epidemics due to cerebrospinal meningitis bear an analogy to acute poliomyelitis, and certain authors have published accounts of "so-called infantile paralysis." These opinions have perturbed the minds of many physicians so greatly that the question of infectiousness is still a matter for discussion. But taking into consideration the articles which have recently been published, the conclusion that we arrive at to-day is almost general, though not unanimous, that the authenticity of the epidemics of infantile paralysis cannot be contested; a fact which contributes to a great degree in confirming the opinion as to the infectious origin of the classic type of sporadic infantile paralysis which was held by M. Pierre Marie. Moreover, the recent experimental researches have given considerable support to the theory of the infectiousness of this disease.

Let us admit at once that though the pathogenic agent of this disease is not known at the present time, its existence is no longer a matter of doubt. If we have not been able to isolate it, the cause must be attributable to its dimensions being so small that it cannot be seen by the microscope or the ultramicroscope. In fact, this pathogenic agent is able to pass through filters no matter how closely woven the paper is. Similar to the pathogenic agent of rabies and vaccine it is a filtrable virus. Certain experimenters have described a diplococcus as being the microbe of infantile paralysis, but this has never been satisfactorily proved. As Levaditi remarks, these experimenters have not as yet given us such proofs that all doubt would be set aside.

Flexner and Lewis have furnished us with interesting results by treating a culture of the virus of poliomyelitis with a boullion to which are added serum and ascitic fluid. Levaditi has arrived at similar conclusions —namely, if one grows the filtrates containing the active virus, the fluid of the culture thickens at 37 degrees C. By employing the process of coloration advocated by Loeffler, Levaditi succeeded in revealing in the boullion, at the bottom of a crucible by centrifugation, very small corpuscles which were more or less round. But it is still impossible at the present time to have a precise idea of the morphology of the parasite which causes acute poliomyelitis.

Experimenters have been more successful in their attempts to reproduce the disease in monkeys. Levaditi has made a complete study of the question and we learn from his work the following details. The disease can be reproduced in the monkey by inoculation. To do this an emulsion of certain tissues or organic fluids are taken from a child that has died during the acute period of the affection. The virus is found in the cord and the brain, in the nerves, in the nasopharyngeal mucous membrane, in the lymphatic ganglions, in the salivary glands, in the blood, and in the spleen. To inoculate an animal (usually a monkey and occasionally a rabbit) the virus is introduced either in the brain, the subarachnoidian space, the sheath of the nerves, the peritoneum, the mesenteric vein, the subcutaneous cellular tissue, or in the anterior chamber of the eye. The intracranial injection was successful in 90 out of 100 experiments. The reproduction of the disease was obtained also by the introduction of the virus in the stomach by means of a sound, by intratracheal injection, and by friction on the nasal mucous membrane with or without scarification. Hence we see that the portal of entry is by means of the digestive, or the respiratory tracts, a matter which from an etiological

and prophylactic point of view is of considerable importance. The resistance of the virus to physical agents is considerable and its vitality explains the facility with which it can be transferred to any distance. It is easily destroyed by ordinary antiseptics.

In the monkey the period of incubation is from three days to two weeks, the average being from eight to nine days. In man the duration of the incubation is longer. This period of incubation in the monkey is reckoned from the time the virus is introduced until the disease is propagated in the organism. The pathological anatomy shows that the disease travels the length of the vessels, probably in the perivascular lymphatic spaces; it sometimes attacks the tissues of the nerves themselves. Levaditi has shown that by injecting the virus in the median nerve, a paralysis results which localizes itself at first in the corresponding medullary territory.

The question as to the mode of contagion has not been elucidated. The presence of the virus has never been satisfactorily shown in the feces or in the urine. But we do know, that if we extirpate a section of the nasopharyngeal mucous membrane of an inoculated monkey and then scrape it, that the filtrate of the inoculated liquid obtained can reproduce the affection. The nasopharyngeal passage is, at the same time, not only a means of infection but a means of disseminating the disease.

What is the degree of immunity conferred by one attack of the disease? The mortality of inoculated monkeys is from 50 to 100 per hundred, that is to say, few survive, but it has been observed that those that are cured are refractory to a new inoculation. But this immunity appears to be only temporary.

Attempts have been made to create immunization against the disease. On account of the analogies between it and rabies recourse has been made to the means employed by Pasteur in the matter of antirabic immunization. By dessicating, by means of potash, fragments of the cord, Pasteur obtained, as we know, an attenuation of the virus which permitted, by repeated inoculations and increasing doses, the immunization of subjects. But in poliomyelitis the virus is very resistant to dessication, its action remaining too violent and from time to time inoculating the patient.

It has been stated that the serum of animals which have survived an attack of poliomyelitis contains antibodies which neutralize the action of the virus. A mixture containing equal parts of serum and the infected substance does not reproduce the disease. The same results can be obtained if the blood of a child, cured by an attack of epidemic acute poliomyelitis, is employed, or according to Netter and Levaditi, if the blood taken from a case of sporadic infantile paralysis is used.

The conclusion which we arrive at from these facts is that there is an identity between classic infantile paralysis and the epidemic form, since the serum of a subject attacked by the first disease contains immunizing substances which protect from the epidemic type. Therefore, we cannot but entertain the possibility of the discovery, at an early day, of the formula for a preventive, or even a curative, serum, the action of which will have its greatest effect on the cells of the anterior horns of the cord which have not as yet been destroyed.

April 10th.

DIAGNOSTIC AND THERAPEUTIC NOTES.

THE TREATMENT OF ASCITES BY MEANS OF SUBCUTANEOUS DRAINAGE.—Paterson (*Lancet*, October 29th, 1910). The writer has modified the procedure of Handley, described some months ago in these columns, with satisfactory results. He uses glass spools, consisting of a short glass tube with a disc-shaped flange at each end. The abdomen is opened in the median line just below the navel and a portion of the omentum resected, to prevent this organ from later occluding the lumen of the tube. At one edge of the wound, the skin is then undermined up to the linea semilunaris and at this point an opening is made into the peritoneal cavity of such a size that the glass spool fits into the opening like a button, being held in place by the flange at each end. The subcutaneous tissue is then sutured to the anterior sheath of the rectus, whereby a closed reservoir results into which the ascitic fluid can drain. The wound is then closed. The immediate result is the formation of a large fluctuating tumefaction, which, however, is soon absorbed, being replaced by a more or less permanent edema. Paterson has used this method in a number of cases of cirrhosis and peritoneal cancer, with satisfactory results.

SKIN DESINFECTION BY MEANS OF AN ALCOHOLIC SOLUTION OF TANNIN.—Zabludowski (*Deutsch. med. Wochenschr.*, 1911, No. 9). The writer has devised a method of sterilizing the hands and the field of operation by rubbing the former two minutes and the latter one minute with a 5 per cent. solution of tannin in 95 per cent. alcohol. It has been positively demonstrated that the eminently successful modern methods of skin sterilization by means of alcohol or of tincture of iodine depend less upon the germicidal than upon the "tanning" action of these substances. This power of tanning the skin, in the way in which leather is tanned, is possessed in a still higher degree by an alcoholic solution of tannin. A series of bacteriologic investigations of areas of skin rubbed five minutes with iodine-benzine-paraffine, four minutes with alcohol-acetone, five minutes with 95 per cent. alcohol and two minutes with 5 per cent. tannin-alcohol, have in the writer's hands, proven that the latter method alone results in nearly or quite complete sterilization. Moreover, whereas all the other iodine or alcohol methods fail entirely if the skin has previously been washed with soap and water, this procedure does not seem in the least to interfere with the successful use of tannin-alcohol. If Zabludowski's findings are confirmed by others a new, efficient and convenient method of skin sterilization will be at our disposal.

THYROID EXTRACT IN ARTHRITIS DEFORMANS.—Wilson (*Brit. Med. Journ.*, December 3rd, 1910). In two cases of arthritis deformans, Wilson noted a marked objective and subjective improvement following the administration of thyroid extract. He believes that this therapy is es-

pecially indicated in cases of so-called chronic villous arthritis, a condition which he considers due to a thyroid insufficiency.

We ourselves have used thyroid extract in a number of cases of this affection, but have been unable to convince ourselves of its therapeutic efficiency. The dried thymus gland, on the other hand, when given in doses of 15 to 20 grains daily has occasionally produced strikingly good results, though even in these cases, the end-result was palliative rather than curative. Our therapeutic resources in this distressing affection must still be considered unsatisfactory.

The Therapeutic Advantages of Colloid Mercury.—Stephens (*Brit. Med. Journ.*, December 17th, 1910.) Stephens contends that colloid mercury is in certain respects greatly superior to other forms of this metal. It is antiseptic to a high degree, non-irritating, non-corrosive and relatively non-toxic. He uses it in a ¼ to ½ per cent. aqueous solution for the cleansing of wounds, in herpes tonsurance in alopecia and as a mouth-wash and spray in diphtheria and tonsillitis. Internally he recommends its use in acute gastritis and as an anti-syphilitic. It is best administered in a one per cent. solution, of which the dose varies from 3 drops for children to 30 for adults. Gastro-intestinal disturbances, salivation and the like were never observed, even after the use of relatively high doses.

Gonorrheal Arthritis and Its Treatment.—Murrell (*Edin. Med. Journ.*, 1910, No. 10.) Murrell has found the various antigonococcus sera entirely worthless. He believes this to be due to the fact that the gonococcus is not pathogenic for horses and apes and that these animals are therefore not competent to produce a gonococcic anti-serum. The vaccine treatment on the contrary he finds extremely efficient, especially where it is possible to produce an autogenous vaccine. He favors small and frequent doses rather than larger ones at longer intervals.

Permanent Results of Artificial Pneumothorax in Advanced Pulmonary Tuberculosis.—Spengler (*Muench. med. Wochenschr.*, 1911, No. 9.) From time to time favorable communications in regard to the results of artificial pneumothorax in pulmonary tuberculosis have appeared in the literature, but none so striking as those recently reported by Spengler. Before a permanently favorable result of the procedure can be assumed, he demands that it fulfil the following three criteria:—

1. The pneumothorax must have disappeared at least nine months ago. For this reason, a number of his cases that demanded repeated injections and all of those so treated in 1909 and 1910 must be excluded.
2. The patient has neither fever, nor cough, nor sputum. Where the latter has persisted it must be free from bacilli.
3. All patients must be entirely well or at least be fully able to do their work.

Spengler reports 15 cases that fulfil these requirements. All of them were cases of advanced pulmonary tuberculosis, most of them with cavities, their ages varying from eleven to forty-three years. The prognosis before operation seemed hopeless in 12 cases and bad in 3. In 7

cases, an exudate resulted from the pneumothorax; in 7, the pneumothorax remained dry; in 1, the pneumorthorax was produced in the presence of a pre-existing exudate. It is essential that one lung be practically free from any tuberculous involvement.

The cases are reported in some detail, for which the reader must be referred to the original article. The results were so astonishingly good, that, in view of the high standing of the man reporting them, they should lead to a wider use of the procedure in apparently hopeless cases.

Dilute Solutions in v. Pirquet's Test.—Wallerstein (*Berl. klin. Wochenschr.*, 1911, No. 10.) Incipient, but active cases of tuberculosis, give a distinctly positive cutaneous reaction, according to the method of v. Pirquet, with a 1 per cent. solution of tuberculin, whereas the latent cases rarely, if ever, react with solutions weaker than 5 per cent.. Advanced cases, on the other hand, require still stronger concentrations for eliciting a positive cutaneous reaction; indeed the more severe the tuberculous infection, the more concentrated the solution required. In this way, the writer believes it possible to determine the degree of infection, by means of the cutaneous inoculation with a series of solutions of tuberculin of varying concentration.

A New Method of Performing Gastrostomy.—Lefaro (*Deutsch. Zeitschr. f. Chir.*, Vol. 108, Nos. 3 and 4, 1911.) As yet Lofaro's method has been attempted only upon the cadaver and in dogs. It is however so novel and of such interest that it deserves attention. The abdomen is opened as usual in the median line. Thereupon the left rectus muscle is divided transversely and the incision carried through into the abdominal cavity. Through this transverse slit, a portion of the stomach is drawn, fixed to the wound and a lateral opening is made, while the original median incision is closed. Lofaro's experiments indicate that this method results in an ideal continence. It seems to deserve a trial.

The Influence of Appetite Upon the Stomach Contents.—Fischer (*Muench. med. Wochenschr.*, 1911, No. 7). Pawlow has shown by means of physiologic experiment that the presence or absence of appetite exerts a decisive action upon the flow of gastric juice that follows the ingestion of food. Fischer's observations confirm those of other clinicians that the degree of acidity of the stomach contents varies greatly according to the palatability of the test meal. Many patients have such an aversion to the Ewald breakfast or the Riegel dinner, that the stomach contents obtained after their ingestion give an entirely erroneous picture of the true state of gastric secretion. Fischer believes that it is far better to allow the patient to choose his favorite dish as a test-meal, while he has devised a combination of foods that in his experience has proven sufficiently palatable to all patients for practical purposes. While we are not inclined to go quite as far as Fischer and those who have expressed similar views, we have found the manner in which the Ewald breakfast is served to be of considerable influence upon gastric secretion. If it suffices to hand a clinic patient a few slices of toast and a couple of glasses of water, more delicate feeders require a neatly arranged tray, with linen, pretty china and silver.

BOOK REVIEWS.

MODERN TREATMENT: THE MANAGEMENT OF DISEASE WITH MEDICINAL AND NON-MEDICINAL REMEDIES. By Eminent American and English Authorities. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica, Jefferson Medical College, Philadelphia; Physician to the Jefferson Hospital; Author of "A Textbook of Practical Therapeutics," "A Textbook of the Practice of Medicine," etc.; assisted by H. R. M. Landis, M. D., Medical Director to the Phipps Institute for Tuberculosis and Physician to the White Haven Sanatorium. In two octavo volumes, comprising 1800 pages, with numerous engravings and full-page plates. Philadelphia and New York: Lea & Febiger. 1911. Price, per volume, cloth, $6.00; half morocco, $7.50.

Hare's "Modern Treatment" bids fair to occupy the same place in English and American therapeutics that the classic work of Penzoldt and Stinzing does in German. The entire field of medicinal and non-medicinal therapy has been systematically divided into chapters, each of which has been placed in the hands of an acknowledged master in its special field. The calibre of the contributors will be realized, when we call attention to a chapter on Glandular Therapy by S. P. Beebe, Yellow Fever by Agramonte, Diseases of the Circulation by James Mackenzie, Diseases of Nutrition by E. P. Joslin, Urinary Disorders by James Tyson, to select but a few among the eminent contributors. A book of this sort defies detailed criticism, and a few words of commendation are as adequate as pæans of praise. The composite nature of the work brings with it definite advantages. Each chapter, being written by one whose special interests lie in that direction, is a pronouncement by an acknowledged authority in that field; and the undue attention to one portion of the subject, with corresponding neglect of another, which is inevitable when one or two men endeavor to cover the entire subject of therapeutics is thus avoided. On the other hand, the book tends to become rather a series of monographs than a systematic treatise, and rather to embody the individual views of the contributors than to furnish an impersonal encyclopedic review of the practice of to-day. However, every book must have the disadvantages of its merits.

SYPHILIS: ITS DIAGNOSIS AND TREATMENT. By F. J. Lambkin, Col. R. A. M. C., Lecturer on Syphilology, Royal Army Medical College, London, Late Specialist at the Army Headquarters, India, etc. Preface by Sir Frederick Treves, Bart., G. C. V. O., C. B., LL.D. New York: William Wood & Co. 1911. Price, $2.25.

This little work on syphilis is a fair and scholarly presentation of the subject; rather an excellent book in many ways and modern in that it treats of the spirochæta pallida, the Wassermann reaction, and the Ehrlich-Hata remedy, but it is old in its outline and didacticism, since the scheme is adhered to of dividing syphilis into stages with its various periods of incubation, etc. Why cannot someone write a modern textbook on syphilis and treat the disease as a pathological entity? Why should a secondary period of incubation be detailed? The disease goes on from the time of exposure, the spirochætæ are pushing their way into the circulation when the disease becomes disseminated throughout the body. This criticism is an illustration of what can be said of all modern books on syphilis—and it seems difficult for medical authors to break away from the beaten track. Yet of all the smaller books on syphilis this is the most modern which we have yet seen. Col. Lambkin is an authority whose word must be highly valued, for his experience has been vast and his medical contributions many, especially upon the treatment of syphilis.

By way of friendly criticism, what would enhance the value of this little book would be a chapter on prognosis, that would make known to us the information which we are sure the author has at his command. And with this

thought in mind we would rejoice in an additional hundred pages in the next edition, so that the modern conception of syphilis and its pathology could be treated *in extenso* and in the same lucid manner which characterizes the author's present style. By doing this both Col. Lambkin and the publishers would confer a boon on all those interested in the study of syphilis.

THE INTERNATIONAL MEDICAL ANNUAL. A Year Book of Treatment and Practitioner's Index. New York: E. B. Treat & Co. 1911. Price, $3.50.

Next in value to the books which contain new contributions to medical knowledge come those that present these contributions in such a form that they can be used by a wide circle of readers. Of the latter class none fulfils its aim more completely than the "International Medical Annual" which appears in March of each year. This year's issue, the twenty-ninth, is not inferior to its predecessors. Issued by a group of medical men, some of them of considerable eminence and consisting of thirty-three Englishmen, two Americans, two Germans and one Belgian, it covers the entire field of practical medicine so thoroughly that nothing of importance that has appeared in medical literature during the past year will be sought for in the book in vain. The articles are far more than mere abstracts of literature. Under each heading, the work that has recently appeared in that line is presented in a critical and carefully digested form, often so illuminated by the personal experience of the writer, as to rank as an original contribution. Although the bulk of the contributors are English, there is in the book no trace of medical chauvinism. The work of Americans is given full credit, the views of the Mayos being given especial prominence. In this connection it may interest our readers to know that Bartlett's filigree method in hernia operations is finding much favor abroad, four pages and one plate in the Annual being devoted to it. The possessor of a copy of the book, whether he be internist or surgeon, will constantly have occasion to refer to it.

ANAEMIA. By Geh. Obermedizinalrat Professor Dr. P. Ehrlich, Director of the Koenigl. Institut f. Experimentelle Therapie, Frankfurt A.-M. and Dr. A. Lazarus, Professor of the University of Berlin-Charlottenburg. Part I., Vol. 1. Normal and Pathological Histology of the Blood. Second Edition (Enlarged and to a great extent rewritten) by Dr. A. Lazarus, Professor (Berlin), and Dr. O. Naegeli, Privat-Dozent (Zurich). Translated from the German by H. W. Armit, M. R. C. S., L. R. C. P. (London). With 5 Illustrations in the Text and 5 Colored Plates. New York: Rebman Company. Price, cloth, $4.00.

Most of our knowledge of hematology is founded upon the epoch-making work embodied in the first edition of Ehrlich's and Lazarus's Anemia, issued over ten years ago. During this interval many changes have taken place in our conception of the morphology of the blood, but in their essentials the principles first enunciated by Ehrlich still hold good. In this second edition, which is really an entirely new book, Ehrlich himself has taken no active part; but the work has been divided between two of the leading exponents of his school: Lazarus having undertaken the normal and pathological morphology of the red corpuscles and Naegeli that of the white. The subject does not admit of a detailed review; suffice it to say that the book occupies a place in the front rank of works on hematology. The translation is adequate and the plates peculiarly beautiful.

GYNECOLOGIE OPERATOIRE, par Henry Hartmann, Professeur de Médecine opératoire a la Faculté de Médecine. Avec 422 figures dans le texte dont 80 en couleur. Paris: G. Steinheil. 1911. Price, 18 fr.

A careful examination of this interesting volume must convince the reader of the noteworthy fact that no really new method of operation for gynecological anomalies has been advanced very recently, and that the routine operations employed by the gynecologists the world over have become almost—if this expression is permissible—standardized. We see the same descriptions, the same illustrations elucidating the typical plastic operations, or abdominal and vaginal hysterectomies, of course, varying to a certain extent in comprehensiveness and clearness; and it may be said, that in this new French work both text and illus-

trations are of unusual exactness. Nevertheless, it must be admitted that the careful perusal of such a volume written by a distinguished foreigner cannot fail to be of interest and value to the American gynecologist and surgeon in that it reveals innumerable finer points in the technique, in diagnosis, and in the indications for operation, and also conveys a clearer idea of the writer's opinion concerning the comparative value of conservative and operative procedures in certain affections. In this last mentioned aspect the difference of opinion between American and European gynecologists is very obvious.

ATLAS OF MICROSCOPIC DIAGNOSIS IN GYNECOLOGY—With Preface and Explanatory Text. By Dr. Rudolf Jolly, Priv. Doc. Chief Physician of the Gynecologic Clinic, University of Berlin. Only authorized English translation. By P. W. Shedd, M. D. New York. With 52 Lithographs in Color and 2 Textual Figures. New York: Rebman Company. Price, $5.50.

This translation makes accessible to the English-speaking physician the most valuable atlas of gynecological histology ever published. Fifty-two colored lithographs almost completely represent all the histological pictures seen in the examination of scrapings removed from the uterus for diagnostic or therapeutic purposes. The short text points out the characteristic features of each section and the essential differences from similar histological pictures offered by other diseases. These lithographs are drawn with such exactness that the experienced will hardly find any difficulty in diagnosing the disease which each represents.

UEBER ANAPHYLAXIE (UEBEREMPFINDLICHKEIT) IN LICHT MODERNER EIWEISSCHEMISCHER BETRACHTUNGSWEISEN. Von Privatdozent Dr. Wolfgang Weichardt, Erlangen. Wuerzburger Abhandlungen aus dem Gesamtgebiet der praktischen Medizin. xi Band. 1 Heft. Wuerzburg: Curt Kabitzsch (A. Stuber's Verlag). 1910. Price, M.—.85.

In this monograph on anaphylaxis, Dr. Weichardt first reviews our present knowledge of the subject in the light of the recent literature, and then discusses in somewhat greater detail his own considerable contributions to the subject. A perusal of the pamphlet, which does not exceed 19 pages, will serve to give the reader a clear notion of our present knowledge in this difficult and involved field. We note with pleasure that full credit is given throughout to the work of Ameficans.

LES GREFFES OVARIENNES. Envisagées au point de vue de la pratique chirurgicale. Par le Dr. Louis Sauve. Paris: G. Steinheil.

This thesis, published from the clinic of Professor Quénu, gives a detailed account of all the investigations and observations, including those of the writer himself, concerning ovarian transplantation. Sauve, in this little brochure, takes particular care to define the practical value of this operation and discusses *in extenso* the results so far obtained.

TRANSACTIONS OF THE FOURTH INTERNATIONAL SANITARY CONFERENCE OF THE AMERICAN REPUBLICS. Held in San Jose, Costa Rica, December 25, 1909 to January 3, 1910. Published and Distributed Under the Auspices of the Pan-American Union. John Barrett, Director-General, Washington, D. C. 1910.

As the title indicates, this is an account of the papers, committee reports, discussions and other doings of the Fourth Pan-American Sanitary Conference. Much valuable material is buried in the volume, but rendered quite inaccessible to the ordinary reader, by the total absence of any index.

THE PHYSICIAN'S VISITING LIST FOR 1911. Sixtieth Year of its Publication. Philadelphia: P. Blakiston's Son & Co.

A convenient pocket visiting list, with the usual tables and data, not differing essentially from others of its class.

BOOKS RECEIVED.

THE CANCER PROBLEM—A Statistical Study. By C. E. Green, F. R. S. E. Edinburgh: William Green & Sons. 1911.

THE CARE AND TRAINING OF CHILDREN. By Le Grand Kerr, M. D. New York: Funk & Wagnalls Company. Cloth, 75 cents. 1910.

SOMEBODY'S LITTLE GIRL. By Martha Young. Illustrated by Ida Dougherty. New York: Hinds, Noble & Eldredge. Price, 50 cents.

THE INTERNATIONAL MEDICAL ANNUAL. A Year Book of Treatment and Practitioner's Index. New York: E. B. Treat & Co. 1911. Price, $3.50.

DIE PRAKTISCHE BEDEUTUNG DES SALVARSAN FUER DIE SYPHILISTHERAPIE. By Dr. S. Jessner, Sanitätsrat. Würzburg: Curt Kabitzsch (A. Stuber's Verlag). 1911. Price, Mk. 1.80.

LE CANCER. By Docteur Joseph Thomas. Deuxième Edition Revue et Augmentée. Preface du Professeur Albert Robin. Membre de l'Académie de Médecine. Paris: A. Maloine. 1910.

MAKERS OF MAN—A Study of Human Initiative. By Charles J. Whitby, M. D. (Cantab.) With Forty-Seven Half-Tone and Other Plates. New York: Rebman Company. Price, $3.00.

COLLECTED PAPERS BY THE STAFF OF ST. MARY'S HOSPITAL, Mayo Clinic, Rochester, Minnesota, 1905-1909. Octavo of 668 pages, illustrated. Philadelphia and London: W. B. Saunders Company. 1911. Price, $5.50.

LOVE AND MARRIAGE. By Ellen Key, Author of "The Century of the Child," etc. Translated from the Swedish by Arthur D. Chater, with a critical and biographical introduction by Havelock Ellis. New York: G. P. Putnam's Sons. 1911. Price, $1.50.

NEW AND NON-OFFICIAL REMEDIES, 1911. Containing Descriptions of the Articles which have been Accepted by the Council on Pharmacy and Chemistry of the American Medical Association, Prior to January 1, 1911. Chicago: Press of the American Medical Association. 1911. Price, paper 25c, cloth 50c.

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